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GLEANINGS IN BEE CULTURE

NOVEMBER, 1921

AT a meeting of beekeepers in California a few years ago the question was asked if it



Winter Protection in California.

would pay California beekeepers to give the bees more protection for winter than that afforded by the single-walled hive. A beekeeper in the back of the room replied laconically, "Yes, wrap them in lots of honey." In the language of the street this man "said a mouthful." One of the prevailing sins among California beekeepers as well as beekeepers elsewhere, is that of failure to have their bees well "wrapped" in honey for winter. With lower prices on honey, no doubt the bees will be better "protected" in this respect than they were when prices were high; but apparently many beekeepers have not yet learned that it pays well to leave "too much honey" in the hives for winter, especially in the South where the bees are more active at this season.

WE and our readers extend good wishes to Mrs. Iona Fowls Wheeler, for several years



We Extend Our Good Wishes.

past the able and efficient associate editor of this journal. On Sept. 13 she became the life partner of another beekeeper, Mr. Clyde Wheeler of Pittsfield, Ohio, whose acquaintance she originally made in her beekeeping activities, and she will now make her new home at Oberlin, Ohio, her first consideration and care. We do not need to speak words of praise of Mrs. Wheeler. The readers of Gleanings in Bee Culture know how well she served this journal. It was three years ago this month that announcement was made in these columns of the responsible editorial duties she was to be given as associate editor, and she did not fail in them. To rare faithfulness in the performance of duty she added exceptional beekeeping knowledge and high intelligence. This made her services to this journal valuable in a marked degree, and until her asked-for leave of absence to tour the South last winter and spring she bore a large part of the editorial burden and did it always with the finest sense of service to American beekeepers.

In her new field of activity and aspiration, we (meaning readers as well as editors of Gleanings) wish her and hers all happiness and prosperity. We shall hope still to print occasional contributions from her virile pen, for she will remain a beekeeper as

long as bees fly and she lives—and may she live long indeed and prosper.

REPORTS from most sections of the United States indicate that the bees will go into



The Condition of Bees for Winter.

the winter unusually well supplied with young bees, and in many places they are also well supplied with stores; but in other places they are short of stores or have stores of inferior quality. The condition of the colonies as to young bees and winter stores in various parts of the country is also indicated on our market page under "Opinions of Producers" where these two items are given in per cent in separate columns. Taking the country as a whole, the bees are in better condition for winter than usual. No doubt thousands of these splendid colonies of young bees will perish this winter from starvation or in the far North because of poor stores, while other thousands will be so greatly weakened from the latter cause that they will be of no value next season.

It is not too late to feed for winter, and no colonies should be left to perish from starvation or because of poor stores. It is time for beekeepers to quit taking chances on winter losses and provide conditions that will insure safe wintering, preparing each year as for a severe winter.

ABOUT a year ago W. H. Lewis of Edmonds, British Columbia, announced that he



Use of Drugs in Treating European Foul Brood.

had a new treatment for European foul brood. His plan was to shake the bees from the combs, then spray the combs with a proprietary antiseptic preparation containing sodium hypochlorite, this being supposed to reduce the amount of infection in the combs to such an extent that the bees will clean it up entirely.

This treatment was tried out this season by the inspectors of British Columbia; and W. J. Sheppard, chief inspector of apiaries of that province, reports some success with it, in an article in the September issue of the Agricultural Journal (a publication of the Department of Agriculture, Victoria, British Columbia), as well as in an article in the September issue of the Bee World, published in England. Mr. Sheppard also states that at the same time the experi-

ments were being carried out in British Columbia, Arthur C. Miller of Providence, R. I., was testing it out in this country and that these tests were likewise successful.

Various antiseptics have been used in England for years in the treatment of brood diseases, some recommending that the combs be sprayed, some feeding the drug to the bees in syrup, and others depending on fumigation. Strange as it may seem to beekeepers in this country many beekeepers in England still practice feeding medicated syrup to their bees as a preventive measure against brood diseases. The disputes and confusion in England as to the effect of drugs on the brood diseases apparently have come about by the failure to differentiate between European foul brood and American foul brood. The cures reported in the literature by such men as Cheshire, Simmins, and Cowan from the use of drugs indicate that they were working with European foul brood, and the failures reported by others indicate that they were working with American foul brood.

In this country the use of drugs in the treatment of brood diseases was abandoned years ago; but the statement of such men as W. J. Sheppard and Arthur C. Miller as to the efficacy of sodium hypochlorite will, no doubt, create renewed interest in this subject.

There are, however, several questions which those who are well seasoned from a long experience with European foul brood will want answered before they pin much faith upon the new treatment. The behavior of the disease during treatment, as described by W. J. Sheppard, is interesting. When the combs were treated in the spring, there was considerable re-infection, but later a stronger solution was used and the disease was cleaned up. The following is given as typical of what occurred later in the season:

"June 28th, 1921. Colony at Langley, European foul brood very bad; at least 60 per cent of brood dead. Sprayed 8 oz. of B.-K. to gallon of water, to which four teaspoonfuls of "3 in 1" oil was added.

July 2nd. Colony cleaning up well; no new infection.

July 14th. About 5 per cent new infection. Sprayed again, same strength as before.

July 29th. 100 per cent clean. No trace of European foul brood. Full of brood from side to side and storing honey well."

This is almost exactly what might be expected in strong colonies of a resistant strain of Italians if no treatment had been given. No doubt, check colonies were used in these experiments, and probably the data from these will be published later to show just what difference there was in cleaning up between the treated and the untreated colonies. Until this is done the data on the treated colonies are of but little value. The erratic behavior of European foul brood and its tendency to disappear later in the season make it difficult to measure accurately the efficacy of any given treatment.

The solution when sprayed with a fine mist sprayer, so that it penetrated well into each cell, is reported to kill all the eggs but not the larvae, and the bees apparently are stimulated to clean the combs after they were sprayed. Both the destruction of the eggs and the stimulation to clean up would tend in the direction of a cure whether the material functions in killing the germs of the disease or not. If this treatment should prove effective in the practical control of European foul brood, it would be interesting to know to what degree the material destroys the infection and how much of the cure is effected by reducing the amount of brood and stimulating the bees to greater activity.

However effective sodium hypochlorite may prove to be after further experiment, beekeepers who have learned to control European foul brood, by fortifying their apiaries against its inroads by means of stronger colonies of a good resistant strain of Italians, will probably not often need to resort to the drug treatment; but when preventive measures fail, the drug treatment, if dependable, may be of great value.



IN OUR "Gleaned by Asking" department in this issue, the question comes up as to the



**Amount of
Shrinkage in
Feed Given.**

amount consumed by the bees during the process of feeding. When feeding for winter beekeepers count

on a considerable shrinkage, but there is no agreement as to how much to expect. So much depends upon the time and the manner of the feeding that experimental data obtained under one set of conditions may be entirely misleading and lead to conclusions far from the truth. Some contend that there is a shrinkage of one half or more in the weight of the syrup that is fed when it is finally stored in the combs, while others contend that the shrinkage is only a small percentage when the syrup is thick so that but little if any ripening is necessary. The great difference in the amount of shrinkage with syrup of the same density depends, of course, on the degree of activity of the bees during the feeding process. This is well illustrated in the difference between stimulative feeding in the spring and feeding for winter late in the season.

About 25 years ago when most of the honey produced in this country was produced in sections, many carefully conducted experiments were carried out by different beekeepers to determine the amount of honey that reappeared in the form of comb honey, when feeding back extracted honey at the close of the honey flow to complete unfinished sections. The data from these experiments recorded in the beekeeping literature at that time indicate that favorable conditions were necessary to secure as much as

two pounds of comb honey for every three pounds of extracted honey fed, there being many cases where the loss was greater and a few cases where it was less. Feeding back to have unfinished sections completed is quite a different problem from that of feeding for winter, especially when the syrup is simply stored with but little modification by the bees in empty cells and no comb-building is necessary.

When the feeding is done in the fall, after most of the brood has emerged, the bees probably store the feed in the combs with the least possible shrinkage. The colonies are then preparing for their winter quiescence and the bees are naturally inclined to be less active than earlier. The queen has quit laying, the nurse bees are no longer secreting larval food, and the habits of all the bees as to their diet have been changed to harmonize with the new condition of rest. At this time if any honey is being handled, it is moved from the more remote parts of the hive to the now vacant cells, from which brood has recently emerged, where it will be within the cluster. Honey is moved in this way apparently without excitement or undue activity.

If a heavy syrup, nearly as heavy as honey, is fed at this time it will be stored rapidly and without much loss while being handled by the bees. It will be stored in the now vacant cells from which brood has recently emerged. If the syrup is given while it is still quite warm and fed in such a manner that it is stored quickly, the excitement from feeding is soon over and the colony again becomes quiet. Under these conditions, the usual thing is to expect at least as many pounds of thick syrup being stored in the combs as there were pounds of dry sugar used in making it; but usually there is more.

While at first thought late feeding may appear objectionable it has the advantage of causing less activity on the part of the bees, which means less of aging and less waste of food. In addition to this is the great advantage of giving good feed so late in the season that it is placed where it will be used first during the winter, thus insuring good stores for the period of winter confinement regardless of the quality of the stores already in the hive.



BEEKEEPERS have reason for rejoicing because of the more active movement of honey this fall, for



What About the Future of Beekeeping?

this means much more to the industry than merely disposing of the season's crop and that held over from last year. Pushing the sale of honey now means building for the future. Whether the present activity of the market will continue for long no one can tell, but the unusual effort now being made to move the honey

to consumers thru every possible channel must result in a permanent gain for the industry. Apparently honey is being brought to the attention of more people this season than ever before. It is being sold direct at the roadsides, at the apiary, and by house-to-house canvassing. It is being advertised in local newspapers not only by beekeepers but also by grocers and chain stores. It is being sold by the mail-order plan, and new consumers are being hunted up in every conceivable way. Cities and even States have staged a "Honey Week" during which intensive advertising has been carried on and large quantities of honey have been sold. Large bottlers of honey are spending annually great sums of money to push the sale of honey thru the regular trade channels.

Up to the time of the passage of the Food and Drugs Act, June 30, 1906, by the Federal Government and the enactment of the various State Pure Food Laws, much of the honey produced in this country was in the form of comb honey, the production of which prevented beekeepers from greatly expanding their business. Most beekeepers of that period operated but one apiary, only a few of the most daring attempting to produce comb honey on a large scale in out-apiaries on account of the swarming problems. Since the passage of the pure food laws the production of honey in this country has increased by leaps and bounds. Unfortunately no figures are available to show accurately the extent of this increase, but production had undoubtedly been increased many fold before the tremendous stimulus to greater production which was brought about by the sugar shortage incident to the war. Finally, with production at full speed, came the slump of last year.

Honey production like most other industries is now passing thru a most critical period, and the further development of the industry in the immediate future will depend largely upon the successful disposal of the stocks of honey now in the country at a fair price to the beekeeper. If this can be accomplished now while the export trade in honey is so greatly reduced and large quantities of honey are being imported, beekeepers can go ahead with more confidence in their business than ever before, for it will mean that the increased use of honey in this country has more than kept pace with the increase in production.

Beekeepers should not cease their efforts to increase the use of honey when their crop is sold. We still have a long way to go in popularizing honey as a food. Whatever gain is made in new consumers should be kept, and those who have made a lot of new customers should see that these consumers are supplied with all the honey they want thruout the year. We need to have 52 "Honey Weeks" in a year instead of but one. Let us put honey on the American tables to stay.

F. W. L. SLADEN

In our October issue brief mention was made of the untimely death of F. W. L. Sladen, Canada's Dominion Apiarist, his death being ascribed to a drowning accident and so reported to us. A close friend and associate of the dead apiarist, C. B. Gooderham, has now sent us the following brief account of the death and life work of Mr. Sladen:

On Sept. 10, F. W. L. Sladen, Canada's Dominion Apiarist, died of heart failure while bathing at Duck Island, in Lake Ontario. Mr. Sladen had been suffering from heart trouble for several years, and only three years ago was ordered by his physician to take a long rest. It appears that Mr. Sladen, who could not swim, had been in the habit of bathing in shallow water at the edge of the lake after finishing his work with the bees, and on Saturday went into the water as usual when he was suddenly stricken with heart failure. Mr. Sladen was not missed from his tent until the next morning when a search was made by Mr. Thomas, the lighthouse keeper. Mr. Sladen's clothes were found on the shore, and the body was found in the water about 70 feet from the shore.

Mr. Sladen was born in 1876 at Shooters Hill near London, England. He was educated privately and commenced beekeeping at the age of 13. He also became keenly interested in the bumblebees and solitary bees and spent nearly all of his spare time in studying them.

At sixteen he wrote "The Humble Bee, Its Life History and How to Domesticate It." He also wrote a series of articles on the wild bees for the British Bee Journal. In 1896 he visited India to study the bees of that country, especially *Apis dorsata*, *A. florea*, and the domesticated varieties of *A. indica*. In 1901 he visited prominent beekeepers in Canada and the United States. It was in March of that year that he discovered the function of Nassanoff's organ in the honeybee.

All this time Mr. Sladen was specializing in queen-rearing and bee-breeding, and he developed a hardy golden bee suitable for the trying English climate. The subject of queen-rearing and bee-breeding

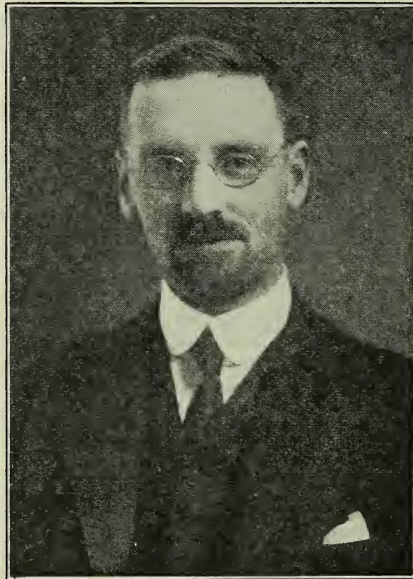
were studied thoroly, and in 1904 he published his book, "Queen-rearing in England." A second edition of this book was issued in 1913.

In 1912 he joined the staff of the experimental farm at Ottawa as assistant entomologist for apiculture, and in 1914 when the bee division was separated from the entomological branch he was given the position of apiarist in charge. In 1920 this position was changed to Dominion Apiarist.

Since coming to Canada Mr. Sladen has done much for the advancement of apiculture. Almost his first work in Canada was a study of the honey-producing plants from coast to coast and of the conditions under which they secrete nectar. He has also given much study to swarm control and had developed his two-queen system by which swarming is controlled and two queens are wintered over in each hive. He has also devoted considerable study to wintering problems and recently issued bulletin No. 43 on "Wintering Bees in Canada."

Queen-rearing and bee-breeding, however, have been Mr. Sladen's first consideration, and experiments have been car-

ried on annually by him in different parts of Canada. In 1919 a mating station was established on Duck Island and isolated mating became a fact. The experiments were continued during 1920 and 1921, and a large number of queens have been reared at Ottawa and transferred to the island for mating with drones of special breeding. Excellent results have been obtained, and purely mated queens have been distributed to branch farms and beekeepers in different parts of the Dominion. It was while carrying on this work at Duck Island that Mr. Sladen met his death.



The Late Dominion Apiarist.

W H E T H E R
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THE QUIESCENCE OF WINTER

Relation Between Quiescence and Good Wintering. How to Help Bees Remain Young

By Geo. S. Demuth

North where winters are long and severe, or in the sunny South where there is but little if any cold weather, the wintering of bees, in its final analysis, consists in the saving of their energy so that they may live longer than in the summer. In the North, this prolonging of the life of the bees is necessary for the existence of the colony until brood-rearing can be safely begun, while in the South it is largely a matter of the saving of stores and preventing the colonies from becoming too weak for profit.

To live long, bees must live slowly. Ideal wintering would mean the reduction of the activity of the bees to the lowest ebb throughout the winter, so that the workers which are young in the fall will still be young in the spring, aging but little as the months of activity go by. In a sense wintering may be thought of as putting the bees away in cold storage to keep them fresh until spring.

The Bees' Instinct for Thrift.

How fortunate that honeybees are willing to give up the active life of summer, cease brood-rearing, establish a new (lower) colony temperature, and remain almost motionless for days and even weeks at a time, apparently for the sole purpose of saving to the uttermost their vitality and their supply of food! If it were not for this instinct for quiescence during the long winters of the North, none of the worker bees could live from fall until spring; and, even if they could, they would, no doubt, consume in winter about all they could possibly lay up in the summer. Without this winter rest there could be no beekeeping in the North. In fact, without this strong instinct for saving, there would perhaps be no beekeeping anywhere, for otherwise there could not be any surplus honey for the beekeeper.

Great Variation in Expenditure of Energy.

The honeybee adjusts the spending of its resources according to its needs in a most remarkable manner. It spends lavishly when spending is necessary, but saves miserly at other times. Dzierzon in "Rational Beekeeping," aptly describes the great difference between the slow living of late fall and early winter and the fast living at other times as follows:

"The vital activity of the bees varies a great deal according to circumstances and the time of the year, and the quantity and quality of food necessary are dependent thereon. The quantity of honey which a bee is able to hold in its stomach, may under certain circumstances afford it ample food for more than a week; and under different

circumstances may be insufficient to prevent death from starvation within 24 hours. If we compare life to a process of combustion, then a bee's life is at

one time like a spark glimmering under the ashes, and at another, like a bright flame which in a few minutes consumes the combustible matter that would have fed the but glimmering fire for a much longer time."

But the remarkable thing is that the consumption of food is apparently a definite measurement of the span of the bee's life; the more food consumed the greater the activity, and the shorter its life. The great longevity of bees under favorable conditions is well illustrated in the following from an article by Doolittle, published in this journal in 1895, page 59:

"Quietness is the essential quality for safe wintering, for with it always comes the least consumption of stores, and with a minimum consumption of stores comes the least possible exhausted vitality and the greatest longevity during the spring and early summer days. Under such circumstances, I have had individual bees by the thousand in single colonies live from the first of September until July first of the following year, or a period of 10 months, this being known by a change of queens on or about the 10th of August.

This span of life of 10 months contrasts sharply with that of six or eight weeks when the bees are working hard in the fields. It is by no means every season, even in the North, that individual bees can be expected to live this long with the best of wintering, for during the majority of springs they no doubt wear themselves out by hard work long before July 1.

This same thought was expressed in a different way by E. D. Townsend in The Beekeepers Review, 1907, page 333, as follows:

"A perfectly wintered bee has just as many days' work in her April first as she had the previous fall. * * * The fact is, a bee's life is not figured by the number of days it lives, but by the amount of work or energy used as its days numbered." This, then, is what is meant by wintering. In perfect wintering the bees are able almost literally to stay the hand of time for several months, retaining the full vigor of their youth for many times the normal span of a bee's life when measured in weeks and days. For the bees, the fountain of eternal youth lies in refraining from work or play.

Greatest Degree of Quiescence in Fall.

Thruout most of the United States the wear and the tear of bee life is reduced to its lowest ebb in November and December. At this time the bees remain quiet within

their hives at temperatures which at other times would cause them to fly freely, not being tempted out every time the temperature rises to the point for safe flight. At this time they are not sensitive to slight disturbances, which at other times would rouse the entire colony to activity, apparently being comfortable and content to remain almost motionless day after day unless disturbed in some way. If the same degree of quiescence could be maintained until spring, the bees would then come out as if having slept during a long night.

Apparently the same degree of quiescence is maintained as long as the temperature within the hive ranges between 57° and about 65°F., and the bees are comfortable and not disturbed, but the trouble is these conditions are seldom present thruout the winter. As the winter progresses the bees become more active and more sensitive to slight disturbances until finally brood-rearing is begun, the length of the broodless period being determined by the length of time the conditions are favorable for quiescence. Strong colonies of young bees will remain quiet and refrain from brood-rearing for four or five months in the North if well protected and supplied with good stores; but colonies made up chiefly of old bees, very weak colonies, unprotected colonies subjected to great extremes of temperatures, colonies having poor stores, or colonies that are disturbed mechanically or by feeding will become active and begin brood-rearing after only a month or two of broodlessness. The quiescence of November and December is an unstable thing that may be easily upset by any one or more of many factors which tend to upset it.

How Quiescence is Disturbed in Warm Climates.

In the South, frequent warm days tempt the bees out of their hives, and they waste themselves in fruitless searching over barren fields or perhaps in defending their hives against robbers or in taking part in robbing other colonies. In some cases, in gathering a meager supply of food late in the season, they waste away so much that early in winter the colonies are reduced to mere nuclei that must begin to rear brood soon to save the life of the colony. For this reason, colonies are often much stronger at the beginning of winter in the North than in the South.

In the tropics the bees attempt to rest during periods of dearth of nectar, but they are almost constantly disturbed by the high temperature, by robbers, and in many other ways. At its best the wintering of bees in warm climates is a wasteful process, and it is doubtful if any individual bees there ever live as long as in the cases observed by Doolittle in New York State.

Perhaps some day, beekeepers in the South will put their bees into cellars that are deep enough underground to keep them quiet and broodless until time to take them out

in order that they may build up to full strength for the honey flow, instead of permitting them to waste themselves and their stores in useless activity. Already beekeepers in some of the southern States are packing their bees for winter in order to keep them quiet, pointing out the fact that it is just as important to prevent the temperature going above that required for quiescence as to prevent its falling below. In other words, if winter packing in the South will keep the temperature within the hive between 57° and about 65°F., the bees will live longer, consume less, refrain from brood-rearing longer, and of course be in better condition in the spring than if the hive temperature fluctuates above and below these limits. In the southwestern States some beekeepers report better wintering and less consumption of stores when the hives are shaded during the winter and have entrances toward the north.

Two Great Disturbing Factors in Cold Climates.

In the northern portion of the United States and in Canada, quiescence is often upset by one or both of two great disturbing agencies, viz., low temperatures and discomfort from the retention of feces, but both of these are within control of the beekeeper. The lower the outside temperature, of course the more heat must be generated to keep up the temperature within the cluster. While the bees on the outside of the cluster are apparently quiet when it is quite cold outside, the active bees at work generating heat are within the cluster hidden from view. If a comb is taken out from the middle of the cluster in zero weather, the bees on the inside of the cluster will be found quite active, ready to fly out and attempt to sting, while those on the outside are not at all alert. Heat generation to keep up the cluster temperature is not confined to the North, but to a less degree is necessary during cold weather thruout most of the United States.

Discomfort from Accumulated Feces Often Most Destructive Factor.

While in unprotected hives heat generation destroys the vitality of the bees rapidly, the activity resulting from discomfort from accumulated feces is often much more destructive. In fact, if the bees are using poor stores, a month of confinement without a cleansing flight may cause them to become so active because of the distress that the cluster is broken and the whole hive is warmed up almost to summer temperatures. When this happens the bees, of course, age very rapidly since they, no doubt, generate much more heat than would be necessary to maintain the proper cluster temperature when the temperature outside is below zero. If the bees are not relieved by a cleansing flight, this activity is constantly increased until the entire cluster becomes a seething mass that soon burns

out the lives of the bees. If the bees are in this condition in a cellar the protection afforded by the cellar can no longer function, because they now generate more heat than would be necessary to keep warm if outside. If a day suitable for a cleansing flight occurs, such colonies, if outside, will relieve themselves if the bees still have sufficient strength to fly and return to the hive; but the aging resulting from such excessive activity makes them more sensitive to disturbing factors, and the same degree of quiescence is not again possible for them, which makes the next period of confinement still more destructive. If such colonies do not consume all their honey and starve in midwinter, the bees usually die off miserably early in the spring in the futile attempt to rear young to take their places.

On the other hand, when bees do not have to generate much heat, as when wintered in a good cellar or well protected outside, and at the same time have good stores, such as either well-ripened straight clover or alfalfa honey or granulated sugar syrup, the accumulation of feces is so slow that the bees remain quiet thruout the longest northern winter without a cleansing flight, being nearly as young in the spring as they were in the fall. Somewhere between these two extremes is the manner in which the vast majority of bees in the North come thru the winter.

At first thought one would expect bees to winter much better in the cellar than outside, farther south than cellar wintering is now practiced, on account of not being exposed to freezing temperatures; but, unless the stores are of the very best, bees in a good cellar often suffer greater wear and tear from restlessness than if exposed to extreme cold outside but having occasional cleansing flights. Of the two great disturbing agencies in the North, cold and accumulated feces, the latter is often much more destructive. For this reason the first consideration for successful wintering year after year in the far North is that of good stores.

Conditions for Proper Cleansing Flight Before Cellaring.

When bees are wintered in the cellar where they are confined four to five months without a cleansing flight, their condition when first put in is extremely important. Beekeepers have tried putting the bees into the cellar under various conditions all the way from the middle of October until the first of January. The poor wintering, which usually results when the bees are put in too early, was formerly attributed to the longer period of confinement, but it is now known that a few weeks or even a month, added to the time the bees are confined, makes but little if any difference if conditions are fa-

vorable for quiescence. If bees are put into the cellar too early, before they have completely changed their habits of living, reduced their diet, acquired the habit of quiescence, and finally, by a good cleansing flight, rid themselves completely of the effect of fall activities, they are not in good condition for greatest quiescence. Perhaps some of the young bees have never been outside for a cleansing flight. A few restless bees in the fall can prevent the colony from becoming quiet all winter. It is better to leave the bees outside until at least five or six weeks after the queen ceased laying and until after the bees have been confined to their hives for at least a short time, so they will feel the need of a cleansing flight. Usually in October and early in November bees will fly but little because they do not need a cleansing flight; but after they have been confined to their hive for 10 days or two weeks they will fly freely on the first suitable day, often voiding feces in greater amount at this time than after four months or more of confinement in the cellar afterwards, thus indicating the importance of leaving them outside until they rid themselves of this last vestige of their more active life of autumn.

After this cleansing flight there is no advantage in leaving them out for a later flight, for after having completely changed their mode of life they do not need further cleansing flights until spring, if the cellar conditions are favorable and the stores are good.

Bees that are put into the cellar not less than five or six weeks after the queen quit laying and immediately after a good cleansing flight following a short period of confinement, usually winter better than if put in either earlier or later. This means that where bees are now wintered in the cellar, the date for putting them in, as a rule, is some time in November, usually after the middle of the month and strangely enough often about the 20th, or just before.

The manner in which bees are handled when putting them into the cellar must make some difference in the beginning of the accumulation of feces. The less the disturbance, of course the better, but fortunately they are not so easily disturbed at this time and they soon quiet down afterwards. A cloudy day is better for putting them in than a bright day, even if the temperature is the same. If carried into the cellar and put in place carefully on a cloudy day when there is no snow and the temperature is between 35° and 40°F., the bees are disturbed but little, and if put in within a day or two after having a good cleansing flight they should be in fine condition for quiescence.

THE VALUE OF WINDBREAKS

Natural Windbreaks Best if Available. How to Build a Good Portable Windbreak

By E. R. Root

IT is only within the last few years that proper emphasis has been placed on the value of windbreaks for outdoor wintering or springing. Several prominent beekeepers, among them Dr. C. C. Miller, I think, have said that, if they had to choose between windbreaks and packing, they would take the former. I personally know one or two cases where bees, in single-walled hives, well screened by windbreaks, have wintered successfully where bees in the immediate vicinity in packed hives out in the open have died. This should not be construed as an argument that packing is of no value. There are many facts to prove that, other things being equal, a well-packed colony in the spring or winter will consume less stores, winter better, and have more brood, than colonies in single-walled hives. But

the ideal combination is a good windbreak and a sufficient amount of packing. Deep snows, if not dense enough to freeze up the entrance, are also very

helpful. The engravings herewith submitted, in connection with the legends beneath, will show that we practice what we preach. We pack and windbreak both.

Nature will very often furnish *natural* windbreaks that are much superior to anything man can put up where there is nothing. A sidehill gradually slanting down from the north to the south, with shrubbery, fence, or trees on top, makes an ideal windbreak. Sometimes a location can be found where the hill on the windward exposure is in form of a semicircle. Cases in point are the apiaries shown in Figs. 1 and 2, these being well protected by a hill. The small



Fig. 1.—This is a natural windbreak on the lee side of a hill. Additional protection is afforded by a picket fence, some farm buildings, and a small orchard on top of the hill. It should be clearly understood that a hillside facing the south is not necessarily a good place for wintering unless some kind of obstruction is on the top of the hill to prevent a north wind from sweeping over the hill and down on the bees. The hillside where the bees are in this case has a southeast exposure. Over on the east side, about 300 feet away, is another hill on top of which there are some buildings and a row of evergreens. Bees have wintered well in this spot for years in what is known as the Leister yard, owned by Adam Leister, who furnishes us bees every year.

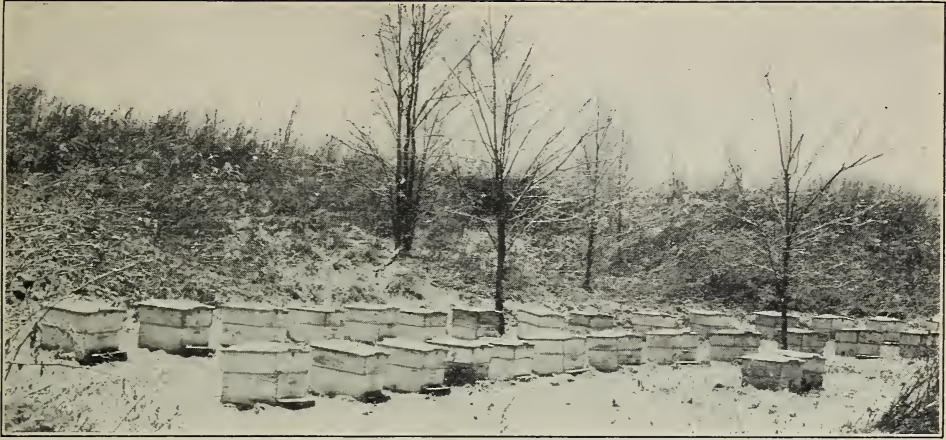


Fig. 2.—This apiary, belonging to Mr. Pritchard, is located at the bottom of a hill which forms a semi-circle protecting the bees against the west, north, and east, leaving only a southeastern exposure. The thick growth of young trees on the top of the hill, together with the larger trees in the apiary inclosure, would make it impossible for any eddying currents to sweep down the hill and on the hives. The arrangement as a natural windbreak is ideal.

trees in the background and down among the hives help to break the violence of the wind. I should unhesitatingly put such a location as ideal.

A good winter location is a cleared spot near the south edge of young timber over which the bees can fly in going to the fields. When the woods are made up of old forest trees it is too much of a good thing because the bees have to fly too high to get out.

Sometimes a spot can be found on level ground where there is a dense growth of young trees on the northwest, and an exposure on the south and east. See cover

picture, this issue. This is all right provided there is no windsweep from the south.

It often happens that no location can be found that provides any natural windbreaks. The only thing that can be made available at once is a high board fence. Experience in our case shows that it may be desirable to move the apiary on account of a failure of honey sources. For example, several farmers in the locality may suddenly take a notion to stop growing alsike and put in some other crop to give the soil a rest. On account of such contingencies our fences are made up of panels, each panel being



Fig. 3.—This is an artificial windbreak surrounding a Root apiary in a small orchard. But as there is a clear windsweep on level ground for over a mile in all directions this fence was put up. The location is desirable because it is in the center of an alsike-clover district.



Fig. 4.—The interior of apiary shown in Fig. 3. It is always desirable to have trees inside of an enclosure like this. In the first place, they furnish shade in the summer; and in the second place they lessen the force of the air currents that strike the side of the fence. The boards are separated slightly to allow the wind to filter thru very slowly, thus preventing a blast from glancing upward and then downward.

held in place by means of braces reaching to the ground on both sides, the bottom end of the braces being nailed to a stake. (See Fig. 5.) This construction not only enables us to "pull up stakes" literally but to move the whole apiary, windbreaks and all, at comparatively little expense. The panels of fence after being taken down can be laid on a big truck and carried to the other location. But even if there were no intention of moving, this construction is cheaper than fence posts that must be long enough to reach to the top of the fence and into the ground at least $2\frac{1}{2}$ feet. They must be strong enough to withstand the heavy pressure of wind. Fence posts meeting these requirements are rather expensive; and a simple brace made up of two $\frac{7}{8}$ -inch boards nailed together is a great deal cheaper, with, of course, the great advantage that the whole outfit can be moved to another yard if necessary. Fig. 3 shows one of our apiaries as it looks from the outside, and Fig. 4 an inside view of the same apiary.

It will be noted in the artificial windbreak that the boards are placed a slight distance apart. As a little of the blast of air filters between the boards it stops it from rushing upward so fast, and then diving downward as it will do with a solid construction.

There are locations where bees have been successfully wintered with comparatively little loss for years, without any windbreaks. Deep snows or some general contour of the country might protect bees in such a place without a windbreak; but to argue that bees do not need windbreaks is like saying

that whisky is conducive to longevity because one or two men have lived to a ripe old age and drank it all their lives.

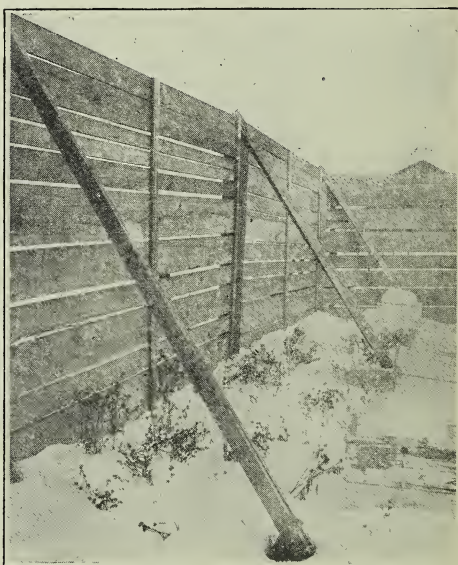


Fig. 5.—Showing details of construction of an artificial windbreak. It will be seen that the windbreak is made up of panels, the boards of which are placed about an inch apart, each panel being held in place by means of braces on the outside and inside. The arrangement makes it possible to move the windbreak as well as the apiary itself. The panel is separated, the braces loosened, when the whole is laid on a truck.

BEST QUEEN CAGE CANDY

Historical Review of Processes Used. Important Discovery by Bureau of Entomology of Cause of Failures

By E. F. Phillips and Jay M. Smith

FOR many years it has been the practice of beekeepers to ship queens by mail, using a soft candy for the nourishment of the queen and her attendants on the journey. Such a candy was probably first made by a German beekeeper named Scholz for feeding bees, and his name is usually given to this candy by European writers. In the United States this candy is usually called "Good candy," named for I. R. Good, Nappanee, Ind., who was the first to make this generally known to American beekeepers, altho, before it was described by Good, the recipe for making it had been published in an American bee book (Langstroth, ed. 1870).

On May 3, 1912, the postal regulations concerning the mailing of queen bees were amended to admit "Queen bees and their attendant bees, when accompanied by a certificate of the current year from a State or Government apiary inspector to the effect that the apiary from which said queen bees are shipped is free from disease, or by a copy of a statement by the beekeeper made before a notary public or other officer having a seal that the honey used in making the candy used in the queen mailing cage has been diluted and boiled in a closed vessel." Since in several of the States from which queen bees are shipped in large numbers there has been no provision for apiary inspection, many queen-breeders found it necessary to make the candy of boiled honey, and others who had their apiaries inspected used such candy as an additional precaution. The regulation created some new problems for the queen-breeder, who was confronted by the necessity of making a new kind of candy. On June 18, 1918, the postal regulations were again amended to permit the mailing of bees without combs under the same limitations.

It has been the experience of many queen-breeders that candy made of boiled honey is unsuited for the shipping of queen bees, perhaps because of the destruction of part of the sugars by the prolonged heating. To overcome this difficulty and at the same time to conform with the spirit, if not the letter, of the regulation, the use of commercial invert sugar, made from cane sugar, has become quite common. This is quite like honey chemically, but is, of course, not identical. When this is used, many queen-breeders complain that the candy gets too hard, resulting in the death of the bees and queen if the journey is long.

Review of Past Methods Employed.

Before discussing experiments recently made on this subject, it seems desirable to review the experience of various queen-breeders in the past; and, as the exact meth-

ods by which these men made their candy are important, it will be well to quote their exact words in several cases to avoid misunderstanding. This

will prevent a repetition of mistakes.

The first description of soft candy for bees that has been found is that in the third edition of Langstroth's "Hive and Honey-bee" (1870). He says: "The Rev. Mr. Scholz [Scholz], of Silesia, recommends the following as a substitute for sugar candy in feeding bees: Take one pint of honey, and four pounds of pounded lump-sugar; heat the honey, without adding water, and mix it with the sugar, working it together to a stiff doughy mass." The honey was heated in this case and the ratio of honey to sugar was 3:8. We have not located the original description of Scholz candy.

We have not been able to locate Good's first description of his candy, so that the exact time of his discovery is in doubt; but in 1881 he said: "I use granulated sugar, with honey enough added to make it stick together." (Gleanings in Bee Culture, IX, p. 374). The exact ratio is not stated and nothing is said about heating the honey. At this time there was considerable discussion regarding the making of this candy, especially if the queens were to be shipped long distances, and in 1882 Good wrote: "If you wish to send queens long distances without loss, use granulated sugar, with honey stirred in for feed. * * * You can send queens safely to California without water with this kind of feed." (Gleanings in Bee Culture, X, p. 562). So far as we have been able to learn, Good always advocated the use of granulated sugar rather than pulverized sugar as was commonly advised at that time and as is now used.

The first marked success in mailing queens across the Atlantic Ocean was that of Benton, then located in Munich, Germany, and the bee journals of the period contain frequent articles by him or by those to whom he had successfully mailed queens. In 1884 he wrote Good regarding his success, and this letter was quoted by Good in an article in Gleanings in Bee Culture (XII, pp. 728-729). The following is taken from the Benton letter: "I have not, however, made the candy just as you made it first, but have employed pounded sugar in mixing it. I have even taken sugar as fine as wheat flour." He further states that the candy on which he succeeded in mailing the first queens to America has been abandoned in favor of the Good candy. In commenting on the merits of the candy used by Benton, the editor, A. I. Root, states that it is probably due to the fact that the sugar had been pounded fine. Nothing is said of the

proportions of honey and sugar used, and it would seem that the honey was not heated.

In *Gleanings in Bee Culture* for 1882 (X, pp. 478-479), Doolittle stated that he was using Viallon candy (made of white and brown sugar and wheat flour); but in the fall of 1882 he abandoned this candy (*American Bee Journal*, XX, p. 533), and in 1883 (*American Bee Journal*, XIX, p. 511) he described his method for making Good candy, which he then used, as follows: "Take about two pounds of pulverized sugar, which can be obtained from any grocery store, and put it into an ordinary tin pan; make a little hollow in the sugar and put therein 3 tablespoons of good clover or basswood honey. Now mix with the spoon till it gets quite thick, when the spoon is laid aside and the batter is kneaded, as a woman would knead dough for bread. This kneading is kept up till you can roll the candy in your hands, as boys roll snowballs. When it is so hard that it will retain its round shape on a flat surface, except to flatten somewhat on the underside, it is ready for use." Nothing is said in these directions about heating the honey, and the exact proportions of honey and sugar are not given. In an article in 1884 (*Gleanings in Bee Culture*, XII, pp. 797-798), Doolittle stated that he did not think that the sugar in the Good candy was of any value as food for the bees, but served only to hold up the honey, and he repeated this statement in several later articles. There is every reason to believe this an incorrect conclusion.

Application of Heat When Mixing.

In his book, "Scientific Queen-rearing as Practically Applied" (1889), Doolittle modified the directions for making the queen-cage candy as follows: "This is done by taking a quantity of powdered sugar, and putting it in any dish; * * * [preferably one of agate ware] * * * having the sugar in the dish, set the same on the stove or over a lamp, and put some nice, thick honey to heat also (such honey as will not granulate easily being preferred, for spring and fall use), letting both heat slowly till of about the warmth that you can conveniently hold your hand in. * * * To get the sugar evenly warmed thru, it may be necessary to stir it occasionally." The remainder of the directions were not different from those given earlier. Ten years later (*Gleanings in Bee Culture*, 1899, XXVII, pp. 268-269), Doolittle repeated these directions, so he must have used this recipe successfully for some time. The only change to be noted in the later directions is that he left the sugar "near the stove" for four to six hours, and that for the shipment of queens to warm climates he kneaded in one-sixth of the bulk of the candy of fine granulated sugar. In the 1891 edition of the *A B C of Bee Culture*, A. I. Root quoted from J. D. Fooshe as follows: "Take

good thick honey and heat (not boil) it until it becomes very thin, and then stir in pulverized sugar."

Apparently the next change made in the recipe for queen-cage candy was that described in 1893 by Mrs. Jennie Atchley (*Gleanings in Bee Culture*, XXI, p. 881). The directions are: "We use nothing except the finest of confectioners' sugar, and thoroly pulverize all lumps, and use honey that has been boiled or brought to the boiling point." In a later article (*Gleanings in Bee Culture*, XXII, p. 379), she states: "I gently boil and skim, or use honey from a solar wax-extractor, as this honey is not so apt to candy."

In 1906, E. R. Root in an editorial in *Gleanings in Bee Culture* (XXXIV, p. 1050), stated: "In selecting an extracted honey for use for making a queen-cage candy, it is *very* important that the source of that honey be known. If unknown it should be thoroly boiled to disinfect it from any *possible* germs of black or foul brood. One boiling may not be sufficient. Boil it one hour and let it stand two or three days, and then boil again another hour. This is better than boiling three hours, all at one time." This author has in mind fractional sterilization, which is, of course, useless since the bacteria to be killed do not germinate in honey. This is the first reference that we have been able to find of boiling honey for the purpose of destroying the organisms causing a brood disease.

The warming of the sugar and honey, as described by Doolittle, was doubtless for the purpose of facilitating the mixing; and the boiling as described by Mrs. Atchley was to prevent granulation of the honey, altho just what difference this can make in the queen-cage candy is not at all clear. In fact, two years ago before in the 1891 edition of *A B C of Bee Culture*, A. I. Root stated: "Sage honey, for some reason or other, has the property of rendering the candy in time as hard as a brick, and, of course, should not be used." Sage honey granulates less quickly than any other American honey and often remains liquid for years. The present authors have not confirmed these statements about sage honey. Following the directions of Fooshe, Doolittle, and Mrs. Atchley, and the warning of E. R. Root, there seems to have been an increasing tendency for those making candy of this type either to heat or to boil the honey, and in some cases the sugar was also warmed.

When the new postal regulation went into effect in 1912, it was rather natural, therefore, that many queen-breeders mixed the sugar and honey, while the honey was still quite hot. In spite of this tendency, there were frequent warnings against the practice in the form of directions for making the candy of cold honey. In 1894 E. R. Root (*Gleanings in Bee Culture*, XXII, p. 662) quotes from a letter from Ph. J. Balden-

spurger, Nice, France, as follows: "I took common beet sugar; pounded it as fine as possible, then dropped in cold extracted honey till the dough was so firm it would hardly flatten down when made into a ball." Baldensperger was a former pupil of Benton and probably learned to make the candy under his direction. In 1917 Grant Anderson (*American Bee Journal*, LVII, p. 130) gives the following directions: "This must be made of the best powdered sugar and well-ripened honey of good quality. Make a stiff dough of the candy and let it set several hours and then work it over again. * * * Never heat the candy in making." In 1915 one of the present authors (*Beekeeping*, p. 426) gave the following direction: "A soft paste or candy made by kneading together confectioners' (not powdered) sugar and honey without heating."

Use of Glycerine and Glucose.

We may omit from the present discussion the various soft candies that have been recommended for different purposes into which other ingredients were placed. It should be stated, however, that, some years before, A. E. Manum had added a small amount of glycerine to keep the candy soft (*E. R. Root, Gleanings in Bee Culture*, 1890, XVIII, pp. 847,849); and in 1893 E. R. Root stated in *Gleanings in Bee Culture* (XXI, pp. 759-760) that he had experimented with glycerine. In 1912, after the new postal regulation went into effect, Tyrrell (*Beekeepers' Review*, XXV, p. 261), quoted a queen-breeder to the effect that he was using glycerine to keep his candy soft. Several attempts have been made to make a candy containing commercial glucose for use in feeding bees in winter as well as for mailing cages; but, as glucose is so disastrous to bees in confinement, we need not go into details regarding this type of candy. In searching for facts regarding the past history of candy for queen-cages, the authors have found 71 articles dealing with the subject, and have passed by many notes of no importance. In the summary so far given no attempt has been made to include even all the better articles, but rather to show the trend of the time.

Recent Experiments by Bureau of Entomology.

During the past year or two complaints from queen-breeders regarding candy made of boiled honey have been unusually frequent, and more recently they have complained of their inability to make a good candy of invert sugar. Because of the importance of the queen trade it seemed well worth while to make some study of the problem, and this was done in co-operation with the Carbohydrate Laboratory of the Bureau of Chemistry, Jay M. Smith being the chemist engaged in the work. The first task seemed to be to make candies of many sorts, just such as had probably been made by queen-breeders, to see how quickly they

became too dry for use. The honeys used were clover, alfalfa, sage, and a mixture chiefly from tulip tree. Sage honey is one which does not granulate, and alfalfa is perhaps the most quickly granulating honey found in large quantity on the market. Candies were made of both boiled and unboiled honeys, of invert sugar, and of boiled honey to which invert sugar had been added to increase the proportion of levulose. It was assumed that, since levulose is hygroscopic, it is the agency by means of which the candy is kept soft, and from this it might be inferred that sage honey would make a better candy than alfalfa honey. At that time the statement of A. I. Root to the effect that sage honey does not make a good candy was unknown to the author, and it was found that when the sage honey was boiled it became more discolored than did the other honeys. In boiling the honeys they were found to boil at a temperature of about 248°F.

After work had been begun on this subject a visit was made to one of the most extensive queen-rearing establishments in the country to observe how the candy was actually made with which such poor results were obtained, it having been impossible to arrive at a correct understanding of these difficulties by correspondence. The candy was there made with commercial invert sugar. This was first heated to 176°F., at which point powdered sugar was introduced, all at one time, in the proportion of one part of invert sugar to slightly less than two parts of powdered sugar. The introduction of the mass of powdered sugar lowered the temperature, but it was then kept over the water bath (205°F.) and stirred vigorously for 40 minutes, in order to produce a thorough mixing of the two sugars and to separate the remaining crystals of powdered sugar completely and to coat each one with a film of liquid invert sugar. At the end of the 40-minute period the liquid had reached a temperature of 191°F.; it was then poured out to cool, but in most cases it had been found that the resulting candy was either too soft or too hard.

Why Heating Caused Frequent Failures.

On returning to Washington a small amount of candy was made by the same process and in similar proportions, with the modification that the powdered sugar was introduced slowly; and in this case it was found that, at the end of 40 minutes' stirring, the whole amount of powdered sugar had been melted (which had not been the case when the larger quantity was made), then on cooling the mass was a hard clear candy. The same was true when even a larger proportion of powdered sugar was used. It is, therefore, evident that the trouble with this recipe arises from the fact that a variable amount of powdered sugar is melted, and, on cooling, it either approaches a hard clear candy on the one hand or a fondant that is entirely too soft

for use in queen-mailing cages on the other. It is clear from this experience that the cooking of the candy during the process of making introduces variations which made the method wholly unreliable.

In the first series of experiments undertaken the honeys were sterilized under pressure of 15 pounds at a temperature of 250°F. for 30 minutes. A second lot of the same honeys was sterilized by boiling in the open air at 250°F. for 30 minutes, and still a third lot of the same honeys was diluted with an equal quantity of water and evaporated by boiling until the temperature reached 250°F. It was found that during the process of sterilization under pressure there was a loss in the amount of levulose in the alfalfa and white clover honeys, which, however, did not show any serious decomposition, as evidenced by discoloration. In the case of the sage honey, however, there was a loss of 7.5% of the levulose content and the sage honey became quite discolored. When the honeys were sterilized in the open the loss in levulose for each one amounted to 7.5%, showing that the effect of heating in the open tends more toward the destruction of levulose than when the heat is applied under pressure. Candies were made of all these honeys and whenever the mixing was done with both the sugar and the honey at room temperature the candies stayed soft.

The reason for determining the loss of levulose, which is a very unstable sugar when heated at such a high temperature and in the presence of a slight percentage of acidity which is present in honey, was due to the fact that levulose has the property of absorbing moisture from the air, and it was assumed that this was perhaps the reason why candies made of boiled honeys often do not remain soft.

Having determined that the levulose in boiled honeys is partly decomposed, it was thought advisable to try adding some levulose to replace that which had been destroyed. A candy was then made of 19 parts powdered sugar, 5 parts of boiled honey, and 2 parts of invert sugar. When this was mixed in the usual way, the resulting candy was satisfactory. The mixing was done while all the ingredients were at room temperature.

Other candies were made by using a small amount of glycerine, which has even greater ability to retain its moisture than has levulose. As has been stated earlier, this method had previously been used by some queen-breeders. Due to the low density of the glycerine, more sugar can be mixed in than when invert sugar or boiled honey is used, and 6 parts of boiled honey, 1 part of glycerine, and 22 parts of powdered sugar were used with success. However, unless there is no other way to obtain a satisfactory candy, glycerine will not be used for this purpose. The effect of glycerine on bees has not been determined.

Various Candies Given Severe Test.

In order to give the various candies made in these experiments as wide a range of conditions as possible, some samples were kept in the laboratory at ordinary room temperature and humidity conditions, and another lot was kept in an air-tight cabinet where these conditions could be controlled. The air was kept dry in this cabinet by means of sulphuric acid as an absorbing medium, and the relative humidity was reduced to 20%, which is as severe a test as any candy in a shipping cage would encounter for any considerable time. The temperature of the cabinet was maintained at about 80°F. by means of a carbon electric lamp. Under these conditions, which represent an exceedingly dry climate with a moderately high temperature, the candies made by the formulae that proved the most useful remained soft for three or four weeks, at the end of which time they were removed.

At the beginning of the series of tests, it had not come to our attention that so many queen-breeders were mixing their candies under heat; and, as a result, all the candies were made by first sterilizing the honeys, then allowing them to cool, and then mixing the candies at room temperature. It was found that practically all of the candies so made remained soft enough for use as long as the tests were continued. Later, when we had consulted the literature more thoroughly tests were made by mixing the sterilized honey with sugar at higher temperatures, and the unsatisfactory results of this method have already been explained.

Honey at 140° or Lower for Mixing.

The conclusion to be drawn as to ingredients which can be used is that boiled honey, commercial invert sugar, boiled honey and invert sugar mixed, or sterilized honey and glycerine can all be used for the making of a satisfactory candy, so far as the softness of the product is concerned. As for the temperature at which the mixing should be done, the conclusion is clear that practically all the trouble which the queen-breeders have encountered has arisen from mixing while the honey or invert sugar is too hot, or in maintaining a high temperature during the mixing process. No harmful results seem to follow from heating the honey to about 140°F., just before mixing with cold powdered sugar.

In conclusion, the proper way to make a soft candy for queen-cages is to pour a good quality of sterilized honey, or commercial invert sugar, into a quantity of finely powdered sugar, while both are at ordinary room temperature. Stir the honey or invert sugar into the powdered sugar until it is no longer possible to stir with a spoon or stick. Then remove the mixture to a mixing board, such as the housewife uses in making bread, and knead the mass thoroughly, adding more powdered sugar as it can be taken up. The proper density of the

candy is reached when the ball stands up with very little flattening at the bottom. The usual proportions will be one part of honey to two and one-half parts of powdered sugar. It usually happens that after a few hours or a day or two the candy becomes softer, in which event more powdered sugar must be kneaded into it. The secret of the failures of the past seems to lie in the application of heat during the making.

Boiled Honey Objectionable.

Since boiled honey is not especially desirable as a food for bees during a period of confinement, probably due to the products of decomposition contained therein, it

is perhaps safest for the queen-breeder to use only commercial invert sugar in the making of his soft candy. It will in some cases be found that this softens with standing more than does the candy made with honey, and if this occurs more powdered sugar should be added. In case commercial invert sugar is used, it must be an invert sugar which is made by the inversion of cane sugar. Queen-breeders whose apiaries are found free of disease by state inspectors will get the best results by using unboiled honey. A soft candy, made by the methods described, can be used as a delicious confection by adding nuts.



WHEN bees are wintered in the cellar they must be prepared beforehand the same as for outdoor wintering, by seeing to it that

every colony has a queen not over two years old. Young queens are better, but not always necessary. Old queens are unreliable.

Stores and plenty of them we must have. Altho I fought against sugar-feeding for years because it led people to believe that honey was adulterated, I wish every beekeeper would feed every colony ten pounds of cane sugar syrup as late as this can safely be done before putting the bees into the cellar. I have always had the best results by feeding two parts of sugar to one part of water. Have the water hot, then stir in the sugar, stirring until the mixture is clear, to be sure the sugar is thoroly dissolved. I add 20 to 25 pounds of extracted honey to every 100 pounds of sugar, but if there is danger of disease don't use honey, just sugar. I've tried putting in acid but could see no difference in the stores.

I think that early-cellarized bees winter better than when put in late. Here they should be put into the cellars Nov. 10 to 17 as a rule. We always get better results by cellarizing at this time than to wait until December. We do not put the bees nearer the cellar floor than 6 inches if we can help it. We leave the $\frac{3}{8}$ -inch entrance open unless the cellar is so we cannot keep the mice and rats out. Then we put on coarse wire guards having not less than $\frac{1}{4}$ -inch mesh. But the mice and rats in cellars annoy the bees anyway, so the cellars should be built mouse and rat proof.

I slide the cover on strong or normal colonies one eighth of an inch ahead for ventilation. I think that this ventilating of hives is the best way to keep the bees dry and healthy. Even in damp cellars it keeps

WINTERING IN CELLARS

Ten Pounds of Sugar Syrup Fed Late Has Given Best Results in this Beekeeper's Experience

By Geo. B. Howe

the bees can get out, and it makes it bad when we put them out of the cellar in the spring as they will cluster out on the back of the hive. I put the bees out in the spring as soon as they can have a good cleansing flight, and since they are healthy they do not dwindle like poorly wintered bees do.

The cellar should be ventilated so that the air is pure. More bees are ruined by not getting fresh air than by cold. They may seemingly winter perfectly, but bees that dwindle in the spring have not wintered well, and will not build up as they should. I pile the hives in tiers as high as six in a tier, but I prefer them not higher than four or five. I have piled them in very close and had good wintering, but there should be ample room if possible.

Let those who prefer to winter bees outside do so, but after 35 or 36 years' experience in cellar wintering, I can see no reason for changing.

Sackets Harbor, N. Y.

[If the combs become wet and mouldy when the covers are sealed on tight, this can be remedied by raising the cellar temperature a few degrees so that the walls of the hive and the combs outside the cluster are not cold enough to condense the moisture given off by the bees before it can escape from the hive thru the entrance. A higher cellar temperature, if not too high, also reduces the activity of the bees especially during the early part of winter, which results in less moisture being given off. As a rule the bees will remain quiet at a higher temperature early in the winter than during the latter part of confinement.—Editor.]

them dry and clean. Without this ventilation they would be almost ruined with mould. If the cover is slid forward even $\frac{1}{2}$ inch it does no harm except that



NOVEL WAY TO SELL HONEY

How a Motor Cycle Can be Used to Sell Honey in Small Towns

I use a motorcycle with side-car outfit, the body being removed and a platform five feet long placed on the springs of the side car. In front I place a box that will hold about 50 bottles, pint size, with a sign, "Honey for Sale." Then I place five supers of honey on the rest of the platform. I have a common five-gallon can cut open on the side, with a rack in the bottom having a wire screen over it. I cut the honey in chunks to fill up this can to sell from. I cover the whole up with wet sacks so that bees will not rob, and over the top of all I place a canvas or gum cover to keep dust off while on the road.

I then go to a small village, open the muffler for a minute in the center of town, display the sign and some bottles, and begin to cut off little pieces of honey to give to the street children. I offer honey for sale from 2 cents' worth to a whole frame. As soon as I get a crowd I show full fine capped combs, and often sell a whole load in a Cuban town in an hour. I have some sheets of paper ready to put a pound or half pound on as they buy.

After doing this in a town a few times, the street peddlers will buy the honey as soon as I get in town at 5c per pound less than the retail price. It is wonderful the amount of honey the public will take in this way. The expense is as low as it is possible to get it, and the trouble also.

Herradura, Cuba.

M. C. Engle.

AN EASY WAY TO PACK

The Quad Hive Permanently Packed on Two Sides and Crowded Together for Winter

In this system, we use four ordinary single-walled hives. The front and one side of each hive are first covered with heavy insulating paper, such as is used in cold-storage plants. Ordinary waterproof paper will answer if the heaviest obtainable is used. The heavier the paper, the better the insulation. We then nail on a block $\frac{7}{8}$ inch thick by 2 inches wide in which a $\frac{3}{8} \times \frac{3}{8}$ -inch groove is cut $\frac{1}{4}$ inch from the outer edge, to receive the outer shell of $\frac{3}{8}$ -inch lumber. This $\frac{7}{8} \times 2$ -inch piece extends from just under the water table, which covers the packing, to the bottom of the hive. Before shoving the outer $\frac{3}{8}$ -inch wall into the groove, we cover the inside of this board with waterproof paper.

The hive is then packed between the

walls with regranulated cork, a dark, almost black product nearly as fine as flour and in no way to be compared with "cork chips," which are simply raw cork untreated to remove the volatile substances that hinder insulation.

We allow one inch between walls for packing, which is quite sufficient for southern Ontario where the thermometer seldom reaches zero. If we had a higher altitude or were further north, we should want more space between the walls; and if we could not get regranulated cork, we would double our packing space.

The water table covering the top of the packing is made of $\frac{3}{8}$ -inch stuff, wide enough to extend over the outer wall to give a hand grip when lifting the hive. We place the top edge of this water table $\frac{3}{8}$ inch below the top edge of the brood-chamber and run putty $\frac{3}{8} \times \frac{3}{8}$ inch to top edge of brood-chamber as if glazing sash. Ordinary glaziers' putty will last several years, but the black sort used by boat-builders is much more durable. When the "quad" is in position, a double wall is formed clear around the outside, and the natural heat of the colonies will keep the single walls of each hive from the effect of frost.

When preparing the bees for winter we lift the hives off their stands and place the stands close against each other. We then lay a 1×6 -inch board across the front ends of the stands, and a similar board half way between, covering the back ends of the four stands. We then set the hives on the stand, placing them close together, put the supers on the brood-chambers, and drop a piece of waterproof paper between the hives reaching from the top of the supers to the bottom of the brood-chamber, across the width of the cluster of hives, and another cut half the width to meet it the other way. We then pass a soft wire around the hives, and another around the supers, and draw the hives and supers tightly against the paper between them, by twisting the wire with a stick. By looking at the photo the paper may be seen extending about 2 inches beyond the outer walls. We crowd a piece of wood $\frac{1}{2} \times 1\frac{1}{2}$ inches under the wire, double the paper over the joint where the hives come together, and put this strip of $1\frac{1}{2}$ -inch stuff on the paper over the crack. The hives are drawn so tightly together that cold air never reaches the single-walled part of the hives. We do not know that this extra protection at the outside joint is necessary; but it may be of some value, and is very little trouble.

The ordinary bottom-board used on a single-walled hive will be noticed at the bot-

FROM THE FIELD OF EXPERIENCE

tom of the brood-chambers, the fronts and side of the hive projecting over them. The entrances are thus protected from being blocked with snow or sleet in winter, and water running down the front of the hive never touches the entrance.

We prefer not to have our bottom-boards project beyond the front of the hive; in fact, they should be enough shorter so that the front edge is one inch or more back from the front of the hive. This is a great advantage when moving bees. A board of $\frac{3}{4}$ -inch stuff cleated at the ends is placed against the front of each hive and reaches to the ground for an alighting-board. They will be seen in the illustration lying on the grass in front of the hives, as they had not been gathered up for winter when the photo was taken.

When packing the supers over the brood-chambers for winter we first place on the

over the supers when crowded together, but any water that gets in where the covers touch each other will be caught by the waterproof paper under the covers. The lattice fence shown at rear is made of $\frac{3}{8}$ x 2-inch strips, spaced one inch apart and nailed diagonally to 1 x 4 stringers. Over this lattice work and running at an angle of 45 degrees are nailed $\frac{3}{8}$ x 2-inch strips spaced 5 inches apart. This fence inclosing the apiary is eight feet high. It is much more effective as a windbreak than a tight board fence, as the open spaces in the fence break the wind up, instead of dipping down in the center of the yard.

The most that can be said against the "quad" plan is that the hives permanently pack on but one side and one end must be mated right and left. That never bothers the man who keeps hives in clusters of four. Our plan is to leave the hives in the position



The quad hive ready for winter.

brood-frames a "hill device," which we make of barrel hoops cut one inch less than the inside width of the hive. On top of this we place a piece of heavy burlap. We then fill the super with any good insulating material, such as regranulated cork, old forest leaves broken up fine, finely cut straw, ordinary forest leaves, cork chips, fine chaff, or sawdust and planer shavings mixed. We give these in the order that 35 years' experience has led us to believe is their relative value. We leave about $1\frac{1}{2}$ -inch space between the top of the packing and the honey-boards, which we use on top of the supers. A piece of waterproof paper is laid on top of the honey-boards, and on that the regular hive covers. They are too large to telescope

shown until the clover harvest. At the advent of fruit bloom we take the packing out of the supers and fill them with drawn combs, which usually get pretty well filled with brood. When clover opens up we spread the hives apart, put the queen below, put on the queen-excluders, then a super of extracting combs and the super of brood on top. In ten days we cut out the queen-cells and nine times out of ten we get no swarms from those colonies. Keeping the bees well supplied with empty supers also helps in getting this result.

The other picture shows the quartette in action. In the summer of 1920 American foul brood appeared in five colonies in this apiary. They were taken to our "hospital,"

FROM THE FIELD OF EXPERIENCE

put on full sheets of foundation, and four of them now form the quartette shown in the photo. The tall hive has 13 shallow supers and one full-depth that we placed on during fruit bloom, with full sheets of foundation and no queen-excluder. At the advent of clover bloom we put the queen below, then placed the excluder on the brood-chamber, and tiered up the supers as needed. Three of the shallow supers had foundation which was all drawn out and filled excepting one super. The rest of the supers had drawn combs and were all filled with alsike honey. The hive at the left has had part of the crop taken off, and the one just behind it had a recurrence of American foul brood. It was healed this spring and run for comb honey. The latticed building is the "lookout." It

colonies last winter, judging from the pile of supers on the hive when the photo was taken.—Editor.]

A BUMBLEBEE GUEST

Strange Tolerance of a Foreign Species Within the Hive

Last autumn, about the end of September and early in the forenoon, when I was looking for queens preparatory to Italianizing, I was decidedly surprised to find a bumblebee cosily nestling among the other bees. He was in the thick of the cluster, about the middle of a frame. I say *he*, because when I sent it to the Bureau of Entomology at Washington, D. C., Dr. Howard informed me that S. A. Rohwer had pronounced it a male of *Bombus impatiens*—a common underground builder.

My first interest was in the bumblebee, for as long as I thought it a female, it suggested a possible way in which parasitism might arise—thru a hibernating insect seeking the warmth of the honeybee hive. Soon, however, my interest was transferred to the honeybees and their instincts. Why did they tolerate this intruder? If they thought him a drone of their own species, why did they not oust him? During the next few days I "sieved" every one of my colonies and caught all queens and during this process saw not one drone. Their own drones had, therefore, been done away with and there was no honey flow on to make them change their policy.

If, on the other hand, they recognized him as of a foreign species, why did they not expel him? Possibly they have no instinct to meet such rare cases. Do we know of any case of bees driving out or injuring any adult insect except a robber, a strange queen (the latter by balling), or drones in their cells? These, of course, are special cases of peculiar and frequent importance, where a definite instinct is to be expected. But they allow the death's-head moth of Europe to enter—in this case possibly because the big sphinx is too tough for them to harm. They tolerate ants. Do they, to anyone's knowledge, harm the wax moth? Italians will clean them out, but may that not be done entirely by destroying the young larvae or even the eggs?

Whatever the explanation, their tolerance of that bumblebee was a strange thing, and we must not forget that in the realm of biology, from human physiology and psychology to the instincts of insects, it is the exceptional or abnormal that throws most light on the normal. For this reason I feel it is the duty of every beekeeper to report all exceptions or anomalies observed in bee behavior.

Robert W. Hall.

Bethlehem, Pa.



The quartette of hives in summer action, showing that the quad packing does "get by."

is shaded by wild plums and the furniture consists of a chair, writing table, and folding couch.

J. F. Dunn.

Ridgeway, Ont., Canada.

[No doubt, crowding four hives together would result in better wintering even if they are not packed on the exposed sides, but this arrangement affords some protection on the exposed sides as well as top protection. The weakest place as to protection is at the upper edge of the brood-chamber where considerable heat can escape unless the cracks between the supers and the brood-chambers are tightly sealed with propolis. Evidently this weak spot did not harm the

FROM THE FIELD OF EXPERIENCE

MIDSUMMER NECTAR

Plants That Secrete Well During the Hot Weather Season

Concerning the gap between the spring and fall honey flows, mentioned editorially in October Gleanings, in this part of the South at least, it is a result of a lack of flowers rather than of high temperature.

Our spring flow ends early in May, and our fall flow does not start before about the first of October, which leaves quite a gap between these two flows. However, horse-mint, eryngium, cotton, balloon vine, and other plants usually give us several respites from the summer dearth of nectar. Horse-mint is a plant that likes hot weather—the hotter the weather, the heavier the yield, just so it is not too dry. During July, our hottest month, we often get a flow from a plant known locally as purple thistle (*eryngium leavenworthii*). I have observed that this plant furnishes the greatest amount of nectar during extremely hot dry weather. When the July sun, pouring his vertical rays upon a soil already thirsty from weeks of dry weather, causes the surface to open in a network of fissures; when the wonder is that any plant can survive; there are conditions ideal for a heavy flow from eryngium.

Take cotton for another instance. Altho we are outside the regular cotton honey district, we occasionally get a nice flow from this source in July and August. The conditions for heaviest nectar secretion are as follows: Topsoil rather dry, thus retarding plant growth somewhat, causing a heavy fruitage; temperature high, with some humidity but no rain.

There are several other midsummer blooming plants of minor importance in this locality, the majority requiring hot weather for normal nectar yields.

If we ever succeed in closing the gap between the spring and fall flows by the cultivation of various plants, we shall have to make use of such as have their regular order of blooming during the hot months. Neither sweet clover nor buckwheat will answer for this purpose until a Hughes or a Burbank convinces them that midsummer is their proper blooming season. J. D. Yancey.

Bay City, Tex.

A CHEAP WINDBREAK

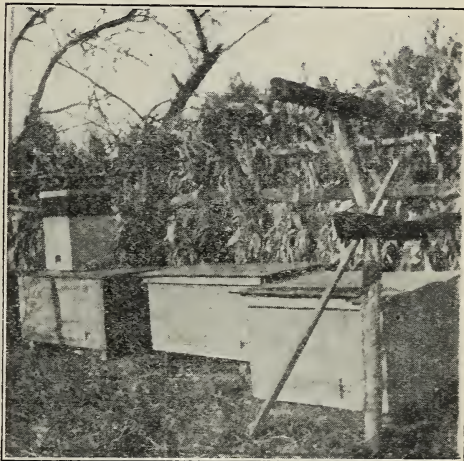
Corn Fodder Stored Against Fence an Efficient Protection Against Wind

For a windbreak I set posts and put up three rails. I then stand corn fodder against the rails. The taller the fodder the better, but it should not be too thick. I leave the

fodder up till the weather is warm enough to take the hives out of the winter cases. I take them out a week before removing the fodder, about May 10.

The day the photos were taken I used two thermometers, placing one on the northwest side of the windbreak, and the other on the sunny side. There was a stiff west wind blowing and the thermometer on the sunny side registered 14°, while the one on the windward side stood at zero. This was at 10 a. m.

I use double packing cases since I do not like the quadruple case on account of having entrances on the cold sides. In the double case the entrance is on the warm side. I face the entrance to the southeast.



It was below zero and the wind blowing when this picture was taken, but the bees in the double packing cases shielded by the corn fodder didn't know it.

My cases are packed with sawdust, four inches on the entrance side with six inches on the other three sides, four inches under, and ten inches on top. The only objection I have is the first cost of the cases, but this is soon paid back by the amount of honey saved, for I can winter a 10-frame colony on from 12 to 15 pounds till the middle of March. This has been the average the past two years. The trouble we have here is to get the colony built up in time for harvest, but with good packing and early stimulative feeding this can be overcome. I begin feeding about the first of April, using a ½-gallon syrup bucket inverted over the hole in the inner cover, feeding syrup two and a half parts of sugar to one of water at first, and weaker later in the season. I put on a second story while the hive is still in the winter case as soon as the colonies need more room.

Sterling Rouse.

Ludlow, Ky.

I HAVE just received a letter from H. E. Weisner of Tucson, Ariz., in which he says: "I fear the concluding sentence of your page in September Gleanings may cause trouble in some parts of the country, for while it may do very well in your locality to give a ripe queen-cell to a colony less than two days after the removal of the old queen, there are other places where it would mean 75 per cent failure. I kept bees in western Oregon before coming here, and there are a number of rules, considered orthodox by noted beekeepers, that will not work out right there, and requeening cells is one of them."



SIFTINGS

J. E. Crane

On page 681, October Gleanings, F. Greiner discusses a most interesting problem as to whether a small brood-chamber is not preferable to a large one for wintering. I have believed for many years that a small brood-chamber is much to be preferred where bees were wintered out of doors in our cold climate. My attention was called to this subject many years ago when one spring I found in an outyard every colony that had been left on eleven combs dead, while those on eight combs or less had wintered fairly well. In my opinion it is poor policy to try to warm a large room with a small stove. Either the room will be cold or you will burn out your stove trying to keep it warm. In practice we try to reduce our brood-chambers to the size of our colonies—ten frames for very strong ones, seven or eight for those of average strength, and from four to six for weaker ones. If they have good food and are well packed they winter very well. It is an easy matter to enlarge the brood-chamber in spring as they need it.

J. Raymond Ball of Knowlton, Quebec, is wondering (page 643) if J. E. Crane's prediction of a poor season following an early spring, has come true. Well! I am glad to report that the season has not been an entire failure, altho very far from what we might call a good one; in fact, the poorest we have had in the past six or seven years. We have from one-third to one-half of a good year's surplus. The late bloom of clover has helped out some, so we shall not have to feed as much as usual.

I enjoyed immensely the introduction of Prof. Hughes to us beekeepers by E. R. Root, on page 622. Hereafter we shall feel that we know him and shall regard him as a personal friend. But isn't that picture of him just great? Aside, Mr. Root tells us that Prof. Hughes is one of the finest Chris-

tian gentlemen he has ever met; that he believes in the sermon on the mount and practices it. Today the world is full of trouble, poverty, and sorrow untold, and

is looking in every direction for some remedy, but so far has seemed to overlook that little rule laid down in the sermon on the mount, "Thou shalt love thy neighbor as thyself."

"Shall we eliminate the word extracted from honey labels?" asks the editor of Gleanings, on page 614. For one I say, yes. As I understand it there are many times more pounds of liquid or extracted honey produced today and placed on the market than there is of comb honey, and there is likely to be a still greater amount. The time was when market honey always meant comb, but times have changed. Let the word "honey" stand for that produced in the largest quantity, and a qualifying word to that produced in smaller quantities. The demand for honey in tins is increasing rapidly.

I enjoy Mrs. Boyden's "Food Page," altho I am not a cook. I have especially enjoyed the page for October and her frank and open statements that honey is not altogether satisfactory for general cooking where sweet is needed, without regard to what "the editor might think or say." Right here I want to tell of a new use for honey that I learned down in Connecticut a few weeks ago. It was to pour a tablespoonful of nice honey over a dish of ice cream. That which I tested was certainly delicious. I was told that some one who had introduced the custom or fashion in a cafeteria or restaurant had reaped a rich harvest of nickels or dimes as the extra charge for the superior quality of such ice cream.

I was glad to learn from "North, East, West and South" that the home demand for honey is on the increase. In Michigan not over 10 or 15 per cent will be sent to the large cities. We have never before had so large a sale for honey in tins. It looks now as tho two, three, and five pound tins were to become the most popular of all packages for honey.

I was amused a few days ago when an automobile party called and inquired if we had honey for sale. When informed that we had, the question that followed was, "Where are your bees?" After opening the back door to the honey-house, so they could see the hives, I had no trouble selling them all the three and five pound tins of honey they could carry.

HAVE you a pet economy such as turning out the hall lights at the risk of your husband's tripping over the furniture, saving bread crumbs or using egg shells to clear coffee? If you haven't, now is a good time to start such a pet and it might be well to adopt some pet economies of your neighbors as well. Several years ago we economized because the cost of living was soaring away above the average income. Now that the average income seems to be volplaning down much faster than the cost of living, it is up to us housekeepers to be still more economical if we do not want our household finances to take a nose dive to disaster.

After all, economy is not a bad word at all. It is not penury or stinginess. Economy is the use of our resources, whether money, time, strength, or anything else, to the best possible advantage, which covers spending as well as saving.

Suppose we consider just a few of the many ways in which we can reduce the cost without lowering the standard of living. In the first place, it is unwise to cut down on the quality of food or skimp the quantity. Milk, butter, eggs, meats, or other tissue-building foods, vegetables, and fresh fruits in season are among the necessities, and beekeepers at least would add honey to this list. But luxuries, such as rich and indigestible desserts, canned relishes and condiments, expensive fruits and vegetables out of season, candies, etc., may be cut down without injuring anyone unless it is the family doctor or undertaker.

If we wish to feed our families economically it is necessary to have a knowledge of food values in order to be able to substitute cheaper foods for expensive and yet assure a balanced ration. Also, if certain classes of foods are omitted from the diet while others are served to excess, nature creates a feeling of dissatisfaction which results in a constant craving, altho the unfortunate may not realize why he is always hungry. He may be actually starving while eating to excess every day. Fed on a balanced ration that same person will eat much less, feel satisfied, and enjoy better health.

THERE are many ways in which the meat bill can be kept down without danger of malnutrition. Meat substitutes, such as fish, eggs, milk, cheese, nuts, grains, dry beans and peas may be used. While authorities differ as to the importance of meat in the diet we all know healthy individuals who eat practically no meat, and it is rather significant that centenarians almost invariably state that they have eaten very little meat.

OUR FOOD PAGE

CONSTANCE ROOT BOYDEN
(Stancy Puerden)

The meat flavor may be extended by combining meat with vegetables, noodles, macaroni, dumplings, and biscuit dough in meat pies, etc.

Insist on having all trimmings sent with your meat when ordering. You pay for them at the rate of the meat from which they are trimmed. Savory stews and soups may be made with the bones as a foundation, and the fat may be tried out for use in cooking or for homemade soap.

Save every scrap of cooked meat. After serving the best portions sliced cold the rest may be cut up, and if tough, simmered in a very little boiling water with or without vegetables until tender, and then used in any way desired. Less desirable pieces will add flavor to soup stock.

Don't confine your orders to the so-called best roasts and steaks. Other portions of the animal are quite as nutritious, just as tempting if properly prepared, afford an agreeable variety to the diet, and are much cheaper, altho one must take into account the fact that certain cheap portions have so much waste that there is little or no economy in buying them.

EGGS are such a valuable food that at this time of year, when their price is almost prohibitive, it is wise to use them as the main dish at a meal rather than as a part of a more or less indigestible dessert. When used in custard or ice cream serve a meal which is otherwise light in protein.

(Don't put food over a gas burner without an asbestos mat, go into another room, become interested in writing an article on food economy, forget the food cooking on the range and let it scorch. This bit of advice was born of experience, for I have just this minute done it.)

The ready-to-serve breakfast foods are great time savers, but the old-fashioned rolled oats, cracked wheat, and cornmeal mush are nutritious, afford variety, and help keep down the food bill, especially if they are homemade on a hand gristmill run by boy power.

Use an abundance of fresh vegetables, including the leafy, uncooked vegetables. Their value in the diet is quite out of proportion to their cost. They provide us with the necessary soluble minerals and vitamins, help to counteract the acid-forming properties of meats and grains, and thus keep the blood stream alkaline and able to resist disease, and furnish "roughage."

ACCURATE recipes, carefully followed with the use of standard, graduated measuring cups and spoons, prevent waste of materials and tend to eliminate

failures in baking. A card index of recipes which you have tested yourself is a time and money saver, as each recipe is where you can put your hand on it instantly, and the recipe may be changed or renewed without spoiling its appearance.

The following recipes should suggest ways of using some of the cheaper cuts of meat, meat left-overs, and substitutes for meat. If you are not well informed as to the cheaper cuts your local market man will be glad to tell you something about them.

The cake recipe produces an article which is light, tender, and of fine grain altho inexpensive and very quickly made. Made with butter it of course has a little finer flavor, but the flavor may be obtained by using half butter and half margarine. Butter is so much needed on bread and for seasoning vegetables that it seems wise to use a substitute in baking, especially as the food value of butter is injured in baking.

CASSEROLE OF BEEF OR MUTTON.

1½ lbs. forequarter beef 3 potatoes sliced
or mutton ¼ cup dried corn, soaked
Fat ½ teaspoon Worcester-
3 onions sliced shire sauce
2 small carrots sliced Salt

Trim and cut the meat in inch cubes and brown in the fat in a hot frying pan, remove to a casserole and cover with boiling water. Add the onions and carrots, cover and put to cook in a rather slow oven. When the meat is tender, which should be in about two hours, add the potatoes, the dried corn and the seasonings, after simmering the corn and the water in which it was soaked in the frying pan about five minutes to take up the juices of the meat, cover and return to the oven for 30 or 40 minutes. With a green salad, bread and butter and a simple dessert this will make a balanced dinner. Or honey may be served with the bread and a fresh fruit for dessert.

Turnips may be substituted for the carrots and the dried corn may be omitted. If mutton is used a cup of canned peas may replace the corn.

BEEF POT PIE WITH DUMPLINGS.

2 lbs. lean beef Salt
4 tablespoons flour Pepper
Boiling water

Cut the beef, which may be a cheap piece from the forequarter or lower round, into pieces suitable for serving, trimming neatly; place in a good-sized kettle with a close fitting cover and pour in boiling water to just cover the meat. Let it boil about five minutes, skim the liquid and then reduce the heat and simmer until tender, which will probably take three hours or longer. This may be done in a fireless cooker or pressure cooker. When the beef is tender, season to taste and thicken the broth with the flour stirred to a smooth, thin paste in a little cold water. Prepare the dumpling dough and drop over the meat from the tip of a spoon, cover closely and let cook undisturbed for about 15 minutes. Serve the dumplings on a large platter with the meat and gravy over them.

DUMPLINGS FOR POT PIE.

2 cups sifted flour ½ teaspoon salt
4 level teaspoons baking- 1 tablespoon shortening
powder 1 beaten egg
About ¾ cup milk

Sift together the flour, baking powder and salt, cut in the shortening with 2 knives; add part of the milk to the egg and use to mix the dry ingredients to a soft dough, adding more of the milk as needed. The egg may be omitted, but it is a great

improvement as it prevents the dumplings from becoming soaked.

BROILED HAMBURG STEAK.

1½ lbs. lean beef Salt
1½ oz. suet Pepper

Put the beef thru a food chopper together with a small piece of suet. This is much superior in flavor to the sawdust-like article which is commonly known as Hamburg steak in the market. A bit of onion may be used as flavor if desired. Shape the beef into a flat cake about ¾ inch thick by pressing gently on a large plate. Keep the edges as thick as the center, if possible. Heat a cast-iron frying pan hissing hot, grease it, transfer the beef cake to it and slip the frying pan under the broiler of the gas range, putting the broiler shelf as close to the broiler flame as the sides of the frying pan will permit. Cook until done to taste, which will probably take five to ten minutes. If it browns on top very quickly it may be necessary to lower the flame of the broiler a little in order to cook it sufficiently in the center, but take care not to let it cook too dry. When done transfer to a hot platter with a pancake turner, dot with a little butter and season with pepper and salt. Serve at once. For a person of weak digestion it is well to leave out the suet. If a gas broiler is not available the beef may be made into a number of little cakes and pan broiled on both sides.

BAKED SAUSAGE AND TURNIP.

3 or 4 turnips Salt
1½ lbs. link sausages Pepper

Pare and boil turnips, mash and drain and season lightly with pepper and salt. Place in a buttered baking dish, cover with sausages, which should preferably be the small ones, well seasoned with sage, prick the sausages with a fork and bake ten or fifteen minutes or until the sausages are done. The drippings from the sausages will take the place of the butter which would otherwise be needed in seasoning the turnip. With this serve baked potatoes and green salad or fruit.

CHEESE PUDDING.

3 large or 4 small slices 1 cup thinly sliced cheese
of bread, lightly but- or about ¼ lb.
tered 2 eggs
½ teaspoon salt 2 cups milk
½ teaspoon dry mustard Paprika

Pile the slices of buttered bread one upon another and cut thru all into strips and then squares. Arrange the bread and cheese in alternating layers in a baking dish. Beat the eggs slightly, add the milk and seasonings and pour over the bread and cheese. Bake slowly until the custard is set and serve hot.

RUMMAGE STEW.

1 cup any kind of cooked 3 small or 2 large onions,
meat, cut small sliced
¼ cup thickened meat 2 tablespoons dried corn
gravy 1 tomato
3 baked potatoes, peeled ½ teaspoon Worcester-
and diced shire sauce
¾ cup boiled rice 2 bouillon tablets
½ cup water in which Salt to taste
rice was boiled Water
2 small slices cooked ba-
con, diced

When you have several meat and vegetable left-overs, such as the first 6 items, mentioned above, combine them, add the onions which have been parboiled, the dried corn, tomato and seasonings and simmer until the onions are done and the flavors blended. Add the bouillon cubes just before you remove from the fire. Almost any combination of vegetables may be used and several kinds of meat. If you have soup stock on hand the bouillon tablets will not be needed.

(Continued on page 729.)

DOCTOR, lawyer, merchant, priest" — somewhere in the ranks of every profession one finds a sideline beekeeper. In Bowling Green,

Ky., lives a lawyer whose bees have been the "open sesame to broad fields of never failing eternal interest." From musty archives he has turned to the green beeyard, from the technicalities of the courtroom to the directness of the bee on the wing, from the contentions of wrangling humans to the harmony of the hive. And it has meant rest and refreshment of soul as well as the widening and deepening of personal interests.

Ten or twelve years ago, when he had been practicing law for 16 years and felt the need of a breath from out-of-doors, Mr. John B. Rodes bought his first hive of bees, "an old-fashioned box set on legs, with little boxes for the surplus honey in the super." The new venture came about thru an old farmer friend, a sort of philosopher of the soil, who had roused his interest in trees and weeds and wild flowers and birds and now finally in bees. "I recall he charged me \$8.00 for this old box hive," Mr. Rodes writes. "But what then? I would have paid him \$15.00 just as readily, and today would not part with the old box for \$20.00. Memories are worth more than wood."

For four years he did nothing with his bees except watch them with increasing interest from the outside—no glimpse within. Then he bought a dovetailed hive with movable frames and discovered a new field open before him. He promptly bought all the standard books on beekeeping and soon found his interest "established forever in these little insects, and as long as life lasts my love for them will never fail."

"I am asked," he continues, "whether my bees are for money or for honey or for fun. Up to the year 1918 I never attempted to make any money out of them. I have taken much pleasure in good honey, and presenting the same to my friends, but I doubt if the books had been kept against me I could have come out even. No, I would never keep bees for money. . . . But if a man wants amusement and interest in life, and development of that secret thing that lies in the soul of every man, and which testifies to his kinship with nature by the very love he finds there for all living and growing things, then it is profitable to keep bees.

"The bees have planted in me what has been called the 'lure of the unending quest.' I have followed them in their flight and been led into studies of birds that prey on bees. The worst enemy of the hive that

Beekeeping as a Side Line

Grace Allen

flies in the air is the summer tanager, clothed in scarlet and flashing like fire. In the evening twilight, as dusk is gathering, you hear him clucking in the shading

ows of the trees. Last summer a male sat upon my hive, within ten feet of me, and continued to swoop down upon the incoming bees as they slowed up to enter their home, until he had gathered some twenty or more in his craw. I murdered this bird. . . .

"And I have followed the bees to the flowers, and I now recall my first glance into the tulip flower of the poplar, and my wonder at the perfect understanding between the bee and the tree."

In conclusion Mr. Rodes says that he is neither an expert nor a professional beekeeper, but he thoroly understands what lay in the heart of Virgil's "old Corycian," living on his few acres of poor soil, where, "planting a few herbs, white lilies, vervain and esculent poppies, he equaled in a contented mind the wealth of kings."

Woman Doctor-Beekeeper.

Down in San Antonio, Texas, lives a physician, Doctor Charlotte Strum. After years spent in the practice of medicine, Dr. Strum found in bees the very interest she needed, just as Mr. Rodes did after years of law practice. She isn't a very strong woman, anyway, and has to limit her practice to that of the office, just because by the time that is done there is no strength left for outside work. She lives in an apartment where no dogs are allowed; she cannot bear cats, hates the sound of a parrot, prefers birds out-of-doors, and so had no growing thing to care for except plants. These kept accumulating until it sometimes looked as tho either she or the plants must move out, when she would gather a lot of them together and give them away.

But one day someone showed her an observation hive with bees inside. She was fascinated with it. Then and there the magic came into her life. Promptly she bought one like it. Someone said she was about to become a "backlot buzzer," but how could she? She hadn't even a back lot to buzz in, only a sleeping porch. So there she placed her new hive, the entrance outside and the hive itself within.

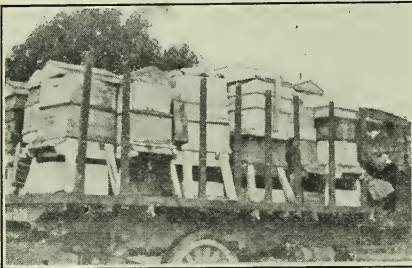
About that time a meeting was called for the organization of a honey producers' association. And Dr. Strum, possessing one observation hive, went to the meeting. And subscribed for five shares of stock! There's genuine enthusiasm, sure enough, the royal generous unhesitating kind that does things. Since that time she has increased not only her colonies of bees but also her shares of stock. And she is glad she bought that first observation hive, for "this interest has

opened the great out-of-doors to me and benefited me very much." She now rents several apiary sites, having 40-odd colonies on each, and is one of the incorporators of a company, with a manager to look after the apiaries.

"Bees mean a great deal to me now," she writes. "Started merely as something alive to watch, they have grown and become very much more than that. . . . When I give up my profession, I want a garden and some colonies in it, and, when I am gone, someone to tell the bees of my departure!"

New Zealand Sideliner.

Miss Mabel Shepherd of Southbrook, Canterbury, New Zealand, is neither a doctor, lawyer, merchant, nor priest, yet she is a most interesting beekeeper. Someone may question whether, with more than 200 colonies, she is really a sideline. But she declares herself that she is maid of all work



Miss Shepherd had 90 colonies moved in one day by motor truck carrying 20 colonies each trip.

in the home, having only occasional help with the housework, and any woman will know that anything else is almost necessarily a sideline. Surely that must be particularly true on a farm—and Miss Shepherd's two brothers are farmers. It did seem queer, by the way, to read in a letter dated January 21, "Harvest time is just commencing," tho what followed was more comprehensible—"and it is our busiest time, as all cooking for the harvest hands is done in the home."

Miss Shepherd has three yards. She decided that to be successful to any large degree in honey production, she must do it on a broad enough scale to pay to hire the hard work done. New Zealand does a large export business, and this trade requires honey to be in cases containing 100 pounds net of honey. It takes strong men to handle tons of honey in 100-pound cases. So she has branched out to three yards, altho, as she puts it, "I am only in a small way compared to some of our beekeepers in New Zealand, especially in the North Island—but success is not to be had anywhere without hard work, and plenty of it."

The queen-rearing yard is at home, and queen-rearing is the end of the work that Miss Shepherd likes best. She got her start with fine queens from the A. I. Root Company. There is also at home a honey-producing yard of 90 colonies that had to be moved there about a year ago right during the honey flow. Then there is a small yard of 30 or more colonies about four miles away. They take a small hand extractor there and work right out in the open under the trees. In the evening one of the brothers comes out in a spring cart and carries home the honey, which is strained and put up at home. Still another yard of about 90 colonies is 25 miles away. There are permanent buildings for camping in (doesn't it sound inviting?) as well as an extracting house with a 4-frame friction-drive extractor and a room for storing the honey.

It is always easy, she says, to get plenty of help from neighbors, who like a change for a few days and don't mind the extra pocket money either; and when they go to this distant apiary, which is "close to beautiful bush" (doesn't it sound attractive?) they usually have their car full of people ready for a jolly combination of camp life and bee work. For beekeeping, Miss Shepherd insists, "can be made one long picnic among beautiful surroundings if cheery associates are chosen for helpers. And the stings play no small part in the production of fun."

Isn't that a fine strong robust view of one's work? But what else than a fine strong robust view of life would be expected of anyone having such a mother as Miss Shepherd has? They are in partnership with the bees, these two, and many a trip the mother takes to the outyards with



Miss Shepherd's 90 colonies on the night they arrived home.

the others. She wires all the frames and "is the general inspiration of the place." Let the beekeepers of the world stand with bared heads before the thought of this mother wiring frames on the happy cheerful New Zealand farm—*totally blind*—"and the general inspiration of the place."



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In Southern California.—The demand for honey shows some activity, with the prospect of growing stronger as the winter comes on. Especially is this true of the orange honey. About ten cents seems to be the selling price in carlots. Only a few cars of the orange honey are still in the hands of the producers.

Now that the season is practically over, I see no reason for changing my early estimate of 25 per cent of a crop for the State as a whole. This seems small indeed, and is perhaps one of the lowest records since the industry has been of importance. The great variety of climate and the different sources of nectar found in our State make a failure almost impossible.

Inquiries have been sent out by a large California company desiring to buy bees in any number up to 1000 or more colonies. This shows interest and confidence in the industry, and, while we may not always desire to sell, it is ever a satisfaction to know that one could sell if he wanted to do so.

A meeting of the Riverside County Beekeepers' Club was held in Riverside on Oct. 1. Plans for the club exhibit were discussed, and arrangements were made to place a creditable display of those things pertaining to beekeeping at the Southern California Fair to be held from Oct. 11 to Oct. 18. A letter was read from the inspector of San Diego County, in which he expressed his regrets at his inability to place an exhibit at this fair. He also told of his efforts to get the beekeepers of his county to exhibit at the fair recently held at Balboa Park, San Diego and their indifference in regard to the matter. Unfortunately, this is too often the case.

Reports were received that Riverside County had obtained the second prize on the feature exhibit at the State fair this year. The honey exhibit, in connection with the wonderful date tree laden with a thousand pounds of dates, was the great attraction and interested many thousands of people. All of these exhibits help, and there is no doubt but that many tons of honey are sold because of the publicity given it by these displays.

Reports were also made of the destruction of several apiaries recently by mountain fires.

L. L. Andrews.

Corona, Calif.

* * *

In Pacific Northwest.—Reports from many districts in the Northwest indicate that the honey crop this past summer has been very light. The contributing causes have been various. In those sections where the main crop is taken from clover in June a light surplus was secured, due to continued cold with lit-

tle rain during that month. In the mountain sections fireweed has been reported as almost a failure in most sections, altho some report a fair surplus. In the Malheur County sections the alfalfa and sweet clover crop was very light, with little promise for the future, due to the rapid spread of the alfalfa weevil which is becoming extremely serious. In this district it is probable that another year nearly 60 per cent, if not more, of the alfalfa fields will be entirely wiped out by this insect. The Umatilla district is about the only section reporting an average crop. Yakima Valley has again suffered a heavy loss from spray poison. All other factors were favorable for a good surplus in this valley.

Favorable weather during September has prevented the bees from drawing on their winter stores for fall brood-rearing, as was the case last year. However, it will be necessary for many beekeepers to feed for winter during the month of October and early November. We can not urge too strongly the necessity of every beekeeper's checking carefully upon winter stores, due to the shortage of nectar this season. An unusual amount of feeding is already being done by the more progressive beekeepers.

European foul brood has been very serious in the Willamette Valley, especially in the Portland districts. Over 50 per cent of the bees have been reported killed in some sections of the valley. Some American foul brood has also been reported. No European disease has been reported in the irrigated, alfalfa-sweet clover sections, but American is very bad in the Malheur district.

The new crop is moving well and the market is stronger. Many of the smaller beekeepers have already sold their entire crop.

The Oregon Beekeepers' Association is planning on a beekeepers' round-up, Jan. 26 and 27, at the famous Round-Up City of Pendleton. The prospects are that we will have a large attendance and a most helpful program.

During the past season eight new county associations have been formed, many of which are taking definite steps toward the appointment of county bee inspectors. Some have already had the appointment made.

Corvallis, Ore.

H. A. Scullen.

* * *

In Utah.—I think I have read in Gleanings that there is no one who has as much time as the busy man, and for the past month I have been trying to prove it, but up to the present I have failed. We have just finished extracting 20 tons of honey and casing 260 cases of comb honey.

The honey season here has been above normal in the northern tier of counties, but not so good farther south in the State on



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account of frost in July in some sections and grasshoppers in other parts.

At the last session of her legislature Utah passed a law making it unlawful to keep bees in box-hives; also a law that every keeper of bees, whether one colony or more, shall register with the State Board of Agriculture and secure a license, paying for same one dollar. A license is required for each apiary, so with my four apiaries I must secure four licenses, each costing one dollar. This is done to keep tab on all bees within the State. The State inspector, acting under directions of the State Board of Agriculture, notifies all county inspectors and all county assessors, so that all bees are located, inspected, and assessed. The law seems a little cumbersome, yet it appears to be working quite well.

There is some disease among the bees thruout the State, but to my mind our greatest trouble is among the beekeepers themselves. There was a large amount of honey carried over from last year; and this season, just before the new crop would come on to the market, that honey was thrown on our local markets, without any co-operation between the beekeepers, at from six to twelve cents per pound, according to how badly the producer was scared. Salesmen were sent out covering every little town, offering honey at ruinous prices until the local market is demoralized. No one but the beekeepers themselves is to blame for these conditions. The crying needs among the beekeepers of Utah are organization and co-operation. M. A. Gill.

Hyrum, Utah.

* * *

In Montana.—Montana has experienced a fair honey season, medium-sized crops being produced in most places. Bees in most sections of the State are in excellent shape with an abundance of good winter stores.

A movement is on foot to form a honey-selling organization, the main purpose of which will be to sell Montana honey in Montana. It is the intention to place a specialty salesman on the road to co-operate with the jobbers. Store demonstrations are planned, as well as the distribution of recipe books.

The Montana State College of Agriculture has added a department of beekeeping. Professor O. A. Sippel, who has been acting head of the Apicultural Department of the Ontario Agricultural College of Ontario, Canada, will have charge of the work. Spacious quarters are being provided for this department in the new biology building now under construction. An up-to-date experimental apiary is to be established at the college grounds. To Professor R. A. Cooley, State entomologist, is due a large measure of the

credit for the establishment of the new department which will undoubtedly be of great value to the bee industry of the State.

The honey producers of the State were well represented at both the State Fair at Helena, Mont., and the Midland Empire Fair at Billings, Mont. About 10,000 pounds of honey was on exhibit as well as large supply displays. State Inspector B. J. Kleinhesselink was on hand with an educational foul brood exhibit, which drew considerable attention. R. A. Bray.

Big Timber, Mont.

* * *

In Texas.—This is Fair time in Texas and exhibits of bees, honey, and beekeeping appliances are more prevalent than ever before. Fairs at Kenedy, Manchester, Seguin, Temple, Dallas, and several other towns are offering a nice line of prizes for beekeeping exhibits.

A number of those living in the live-oak section tell us that there will yet be a flow from the galls on that plant. This is one of the varieties of honey we need a name for. It is not honeydew since it is not the secretion or excretion of insects, and it is not honey since it does not come from the nectaries of plants. It is strictly a plant secretion coming from the rapidly growing plant tissues forming the gall. Honeys from the sap of maple, box elder, stubs of wheat, sugar and sorghum cane, and overripe fruit are also in this class.

The condition of the honey plants has been greatly improved by the rains. If the observations of the old beekeepers are correct, moisture sufficient for a spring blooming of huajilla, agarita, and horsemint is in the ground. A good supply of water in the fall of the year is also in favor of the mesquite, altho we have no record of two mesquite years coming so close together. The large per cent of the new nectar used in brood-rearing comes from winter annuals, and this rain has given all such plants a fine start.

There never was a time before when bees changed hands as they are now. Quite a number of apiaries have changed owners and numerous deals are pending. The purchase price in every case has been good.

Sometime ago I said Texas was the "too" State. Well, it has "toood" again. For a month and a half, heat and drouth stopped all honey flow, making it impossible to finish taking the crop of honey. It looked as if there would be no fall flow, and many expected to feed in order to get winter stores. On September 8 and 9 light showers fell over most of the State, and the night of the 9th it "toood." A rain ranging from four to thirty-two inches of water, according to the United States Weather Station reports, fell over a large part of the central portion



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of Texas. In a few hours, floods, washouts, and wrecks were the order of the day. The one redeeming feature of the storm was that no wind accompanied it, with the exception of one small locality near Austin. We have reports of only a few losses of bees by the flood. This moisture threw many plants into bloom, and by September 20 a good honey flow was on all over the State. Cotton, brazil, granjeno, white brush, sumac, and broomweed are giving a surplus. This flow promises to be prolonged, and the beekeepers are planning to get most of their partly filled supers completed.

Last spring the beekeepers taxed themselves a cent a hive for State advertising. This money was spent in publishing a recipe booklet for the use of honey. These booklets will be distributed at the Dallas Fair. The same booklet, including an ad, will be issued by a number of honey producers. Already 15,000 of these books have been contracted for. The effect of this, together with the American League advertising, is already felt as the demand for honey is rapidly increasing.

Among the plants blooming after our big rain is *Eysenhardtia amorphoides*. The only common name we know for this species is Rock Brush. This name cannot be relied upon, however, as several other kinds of rock brush are common. This species has leaves somewhat resembling catsclaw and a cluster of bloom reminding one of white brush. It has no thorns and has a peculiar odor. The plant is a legume and is much visited by bees. It blooms in May and June and again when rains come in the fall. Two beekeepers report a surplus from it. Old beekeepers who are good observers say that this plant is rapidly increasing in numbers especially between San Antonio and the coast.

H. B. Parks.

San Antonio, Tex.

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In Iowa.—This season will go down in history at the Pangburn apiary as the poorest year we have ever had. We have not extracted a pound of clover honey, and there will be but little of the fall crop that the bees will not need to bring them thru the winter. The bees, however, are in fine condition for winter, provided they are given plenty of stores. Colonies are full of young bees; in fact, they are better than I expected, and I would now say they are fully up to normal; but beekeepers will do well to examine closely and make sure they have plenty of honey, as they are unusually light in stores this fall.

The honey crop in this State has been spotted. About 35 miles east the crop was much like it was with us, and 35 miles west they were getting a good flow while we were getting nothing. The flow seemed to get

better west, at least as far as we have had any reports. Local showers were the rule this summer with us, and I have never seen a good honey flow with these conditions. The season was too dry during the time when the honey flow should have been on; besides we did not have the clover we had last summer, for some reason which I cannot understand. The clover looked fine this spring, but many fields that had plenty last season scarcely had a blossom. We have had a superabundance of rain the past month. The ground is soaked and clover is surely looking fine, so we are living in hopes as all true beekeepers do.

Honey sales have taken a decided change from several months ago. Local demand has been good the past two weeks, as well as mail-order business. It begins to look as tho honey is going to move this fall and winter. I again say, as I said in a former article, that beekeepers should keep their heads and not slash prices below reason, because it will all be sold at a reasonable price before another crop is harvested. Beekeepers must be mindful of the fact that we cannot produce honey and sell at prices that prevailed before the war, and pay the prices for supplies that are being asked. Honey should never again sell at pre-war prices, and it never need sell again at those prices if beekeepers do a little work along educational lines. Read again in October Gleaning's Editor Demuth's editorial on "Honey deserves to be better known." It is a shame to us beekeepers that it is not better known. Who's fault is it? "Brethren, these things ought not to be." If honey were as well known as many other articles of food that people buy as necessities and which contain far less food value than honey, there would not be enough to go around once. "Let us put it over." W. S. Pangburn.

Center Junction, Ia.

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In Wisconsin.—Wisconsin beekeepers have just passed thru one of the most peculiar seasons ever witnessed in this State. The winter of 1920-21 was very mild, and the bees were able to fly practically every month of the year, but the mild winter was very hard on the clover and most of it was frozen out. Spring conditions were good, and the bees should have built up in splendid shape; but, because of the mild weather, they consumed stores rapidly and in the great majority of cases did not have sufficient to build up on.

In a number of cases where beekeepers fed sugar or honey, the colonies were very strong at the beginning of the honey flow and produced a fair crop even in the poorest localities. During the time of the clover bloom the weather was very hot and dry, with little or no rain, and very little surplus



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was secured. By August most of the beekeepers in unfavorable locations had decided that they could not possibly get a surplus and would probably have to feed their bees. However, fall flowers came on early and secreted nectar freely. One beekeeper reports having secured 700 sections of honey after the middle of August in the vicinity of Madison. This apiary was located near low marshy ground where the soil moisture had not been greatly reduced.

The buckwheat honey flow was good and practically every beekeeper in the buckwheat sections secured a fair surplus. During September we had an unusual amount of rain, and the clover and other honey plants are at present in excellent condition.

It is quite likely that some of our beekeepers will come to grief this winter, unless they have held back stores or feed the bees sugar syrup. The weather continued warm and up to October first we had no frost. The bees are still rearing large amounts of brood, and many colonies will go into winter quarters strong in bees, but short in stores unless beekeepers are extremely careful.

Reports indicate an unusual variation in production. Racine, Milwaukee, Washington, Ozaukee, and Sheboygan counties were favored with a good honey flow. The southwest portion of the State and the western tier of counties were away below normal in production, while the northern tier of counties are high. The early yield in the north-central sections was very poor, but all of the good beekeepers were able to secure a surplus from willow-herb and other late summer flowers. The yield for the entire State is less than 40 per cent of last year, and with the exception of Milwaukee and adjoining counties the crop was not more than 50 per cent. A few reports have been turned in showing that it was necessary for some even to feed their bees during the summer.

Lack of organization and co-operation among beekeepers is well demonstrated by the reports on prices. No two beekeepers in any one county seem to have the same standard for prices either wholesale or retail. Prices for the State vary all the way from 16 cents to 35 cents wholesale for comb honey, and from 20 cents to 35 cents retail. Prices for extracted honey run from 12½ cents to 20 cents wholesale, and from 12½ cents to 35 cents retail. One beekeeper reports retailing at 18 cents in 5-pound pails. With such a variation, it is evident that honey prices cannot be stabilized, and in some counties where there is practically no crop at all, beekeepers who have small amounts are offering it at ridiculously low prices. Some beekeepers who report low prices claim that they cannot find a market for their honey, and that the local market

will take care of only small quantities. This in spite of the fact that in some counties there is no honey at all.

Lack of co-operation and a marketing organization to stabilize the price and to secure distribution is evidently responsible for this condition. An organized selling agency should help a great deal in eliminating this situation, and we all hope that within the next few years our beekeepers will become aware of this fact and will unite in a statewide marketing organization.

Madison, Wis.

H. F. Wilson.

* * *

In Michigan.—Colonies went into winter quarters last fall in excellent condition both as to the age of the bees and the quality and quantity of stores. Then came one of the mildest winters ever known, and the colonies naturally came thru in fine shape. The spring was early as a result, and the bees were gathering pollen in late March, tho it is not unusual for them to be held off until late April or early May.

With this exceptionally favorable start, had not the weatherman been partial to some localities and passed the drouth to others, a bumper crop would surely have resulted for Michigan; but unfortunately this particular location got practically no rain in June and July, resulting in a very light crop of white honey. By the way, when the crop is light, the color is always darker and vice versa. The fall honey plants got a very slow start, and the buckwheat that was sown lay in the soil without germinating; whereas, where the soil was naturally moist, everything advanced quite naturally. Then came the rains and favorable weather and the fall plants took a new life; the buckwheat germinated, and fields of this dark honey-secreting plant were in all stages of growth, resulting in a continuous flow until late in September, there being no frost to cut the bloom even at this date. So bees are again going into winter quarters in fine shape.

Now what about the disposition of the honey crop? What we require more than anything else is organization, co-operation, and a well-worked out per capita distribution of our honey. With sugar continually declining and no acceptable offers from the extensive buyers, every beekeeper from the backlot producer to the specialist got out and hustled. With no understanding as to prices they should receive, each one got what he could and with the continuous advertising and soliciting practically all honeys are sold excepting a portion of the dark. One person with some three to four hundred colonies told me that he had two chances in one day to sell his entire crop, after he had it pretty well disposed of, to local parties who wishes to pail it up and



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sell from house to house. Now they are wondering if they really were wise in getting rid of it so cheaply as they did.

Here is the point: We have several thousand colonies in this immediate vicinity, and the honey produced has nearly all been sold locally at a lower figure than was necessary; where but a short distance away in a much heavier populated district with few bees, in town after town and city after city, practically no honey may be found, and many merchants informed me the reason was that no honey had been offered them.

I am still of the opinion that our delicious product, if properly distributed, would bring a price commensurate with its value as a food and with our labors to produce it, even if several times as much were produced as there is at the present time.

East Jordan, Mich. Ira D. Bartlett.

* * *

In Indiana.—In this locality, northwestern Indiana, very little nectar was gathered from fruit bloom. Bees began the clover harvest greatly weakened in numbers, many colonies being on the verge of starvation. A good alsike flow, followed by basswood and an exceptionally good yield of sweet clover, enabled them to store a considerable surplus, amounting to 100 pounds per colony in some yards, with very little swarming. Then followed more than a month of exceedingly dry weather, in which much of the surplus was consumed by the bees in brood-rearing, resulting in enormously strong colonies just at the opening of the fall flow. Heavy rains in August brought the nectar, and the final result is probably the heaviest yield from fall flowers ever obtained in this locality, many colonies having a surplus of 200 pounds or better.

The hot weather thruout September has resulted in colonies exceptionally strong in bees, with very little honey in the brood-chambers. Almost all of the honey being in the supers will, of course, necessitate a great amount of feeding if bees are to be wintered without loss from starvation.

European foul brood, so prevalent a few years ago, seems to be disappearing with the introduction of Italian stock. In fact, there is very little to be found except among dark hybrids. American foul brood seems to be spreading rapidly in this part of the State, and it appears that some apiaries will be entirely wiped out. This, apparently, is one of the results of encouraging everyone to keep a few bees. Most amateurs and the box-hive fellows produce very little honey but plenty of infection.

Practically all honey in this locality is sold locally, or in mail-order shipments or to tourists. I know of none being shipped to wholesale markets. The demand this year,

both for comb and extracted, seems very much better than usual, and many tons are being disposed of.

A course in beekeeping is to be introduced in Valparaiso University this year. I understand that quite a number of students are contemplating taking the work, many of them being ex-service men. E. S. Miller.

Valparaiso, Ind.

* * *

In Georgia.—The early honey crop in this part of the South has been from 50 to 60 per cent below normal, caused by untimely frosts and cold weather late in the spring. Further north in this State the crop was more nearly normal. The cotton in this vicinity has since yielded pretty well for a short time, followed by an unusually good yield from velvet beans; but the bees acted as tho they expected winter soon, crowding the queens to a great extent altho the weather was very warm. Later, came drouth when the bees could get little or nothing for two or three weeks; and now this is followed by a rainy spell, and the bees are gathering pollen freely but very little nectar. They will probably raise a good amount of brood before cold weather comes and be in fine shape for wintering.

I hope the article by E. R. Root in last Gleanings will rouse an interest in sweet clover culture all over the country. I have tried but never succeeded in getting it to grow in this "Coastal Plain," and know of no one that has. I have bought some seed of the "Hubam" variety and intend to try again—this time liming and inoculating the soil. I hope all who can will do the same. It would be a very great thing if this plant were largely cultivated all over the South (and North, too), as it would make much territory available for honey production and greatly improve other territory that is now inferior.

The Georgia Beekeepers' Association, at their meeting in Macon on Aug. 19, were tendered the use of a good-sized building by the Georgia State Fair Commission, for apicultural exhibits at the State Fair, Oct. 27 to Nov. 5 inclusive. Commendable efforts are being made to give there a creditable exhibition of apicultural products. The Beekeepers' Association has made notable progress since its inception and we hope great things for its future. T. W. Livingston.

Harmon Park, Ga.

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In New York.—Beekeepers in the New York region are unanimous in the opinion that this has been a queer season. All kinds and degrees of honey crops from none at all to a bumper yield have been observed. In all, the aver-



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age crop is far below normal. It probably will not total over 40 per cent for white honey and about normal for buckwheat and amber grades.

The season all over the State has been too dry and hot—much worse in some parts than in others. Following a line east to west along the Mohawk valley and canal from Albany to Buffalo, during the early part of the summer most of this country reminded one of the Sahara desert. I don't think that I ever before saw a country so completely dried up as some portions of this region. Some places south of this line were just as dry. Thru all this region the white honey crop was almost an entire failure. A notable exception to this was the limestone areas in Onondaga County and other like spots where alfalfa and sweet clover gave a good yield.

The south-central part of the State had frequent showers at the right time to provide ideal nectar conditions. Beekeepers in this region harvested a fine crop of white honey of extra quality. The buckwheat honey crop was good in this region also, but was only from poor to fair in other parts of the State. The Hudson River valley honey crop was very poor.

A good fall flow, mostly from goldenrod and asters, nearly all over the State, has put the bees in good wintering conditions. We are advising beekeepers to feed from 10 to 15 pounds of granulated sugar syrup to each colony, to offset any ill effects that may be experienced from the aster honey.

No doubt, conditions in the colonies last spring have much to do with the poor yield. Unseasonable warm weather in March and April, with flowers blooming a month ahead of time, caused abnormal brood-rearing. By May most colonies were in June condition. Thousands of colonies used up all their stores and went down rapidly in brood-rearing. Even the provident beekeeper, who had provided an abundance against such an emergency, found a new difficulty in that the queens, apparently having done their best, grew tired and reduced egg-laying at the very time when top speed was needed. Colonies with young queens of last August were not so bad in this, and colonies with such queens and lots of honey kept up brood-rearing.

On May 17 and 18 heavy frosts destroyed much of the fruit bloom, dandelion, and early raspberry bloom at a very critical time. These sources of nectar and pollen would have put into condition many colonies that went down badly at this time. This provided a striking example of the absolute necessity for pollen for brood-rearing. Beekeepers who fed sugar syrup at this time found that the bees did not respond in brood-rearing, because all old pollen was used up and no new supply could be found.

The moral is obvious—save more combs of honey and pollen in the fall.

The matter of greatest interest in all this is that the beekeeper, who queens regularly provides ample honey, and winters his bees well, is the one who will have his "cup right side up" when the honey flow comes.

Ithaca, N. Y.

George H. Rea.

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In Ontario.—The month of September in Ontario was dryer than usual, with complete absence of frost or very cool weather. As a result, buckwheat with other late honey was removed from the hives with less effort than in some seasons. Generally speaking, the late honey flow was fair altho some localities never give any surplus after clover is over. This is true at our chain of apiaries southeast of Hamilton, where the main flow is from clover and the soil is a heavy clay, with no buckwheat or other late forage. In all sections where there was a late honey flow, clusters for winter are large and I suppose mostly composed of young bees, so they should winter well, provided they have an abundance of good stores.

This brings me to the question of feeding, and while feeding should have been done before this appears in print, it can be done quite late with proper precautions. In this case it surely is "better late than never," even if it is true that is "better never late." Just now (Oct. 10) we are busy feeding the bees what they need, and, of course, that means that we are feeding sugar syrup; for under no circumstances would we think of giving them the buckwheat stores out of the supers, even if we sold the buckwheat honey for less than sugar costs us.

We like to do this feeding as rapidly as possible; and to give an idea of what I mean by rapid feeding, last fall my son with one helper fed as high as a ton of sugar a day in feeding up for winter.

Some may wonder why we advise feeding sugar syrup for the cold winter months instead of using buckwheat stores when the honey is just as cheap as the sugar or cheaper. Simply because we have found that in at least one season out of three the buckwheat stores do not give good results, and in such a season the gain more than pays for all the time and extra cost taken up by feeding sugar.

Contrary to what many of us anticipated, the demand for honey keeps good and many beekeepers, including ourselves, are entirely sold out. For the past ten days we have turned down orders until we almost regret that we closed out most of our honey on a carload basis, as we dislike to disappoint customers.

Markham, Ont.

J. L. Byer.

HEADS OF GRAIN FROM DIFFERENT FIELDS

Why Not Crystallized Honey? If the term "extract-ed honey" suggests to the consumer something a little different from pure honey, as mentioned in your editorial in October Gleanings, how much worse are the words granulated, sugared, or candied honey. Each term carries a suggestion of granulated sugar. Why not use the proper word already coined for it, "crystallized" honey? A change is easily brought about.

Surely "pure crystallized honey" would make a better impression on the mind of the consumer than granulated or candied honey.

I once suggested this in a short article to the American Bee Journal, and I notice Hoffman & Hauck have changed their ads to "liquid" and "crystallized" honey.

Audubon, Iowa. E. M. Cole.

Paraffin for Mending Leaky Sections. Leaky sections can be repaired by dipping a table knife into melted paraffin (not too hot), then applying it to the break by a downward motion until the break is covered by a thin film of paraffin. Some irregular sections can be cut straight with a hot knife and then covered by paraffin in this way and so made marketable. Some breaks can be stopped by dropping melted paraffin on them.

There is another use for paraffin in comb-honey production, which we have employed for two or three years. When supers are filled with sections and the springs are in place we apply melted (hot) paraffin with a brush on top of the sections, which makes cleaning comb honey a pleasure instead of a dread job as it used to be. If new supers are painted with hot paraffin on the bottom of the section holders or all over, it does away with a lot of work at cleaning time.

Fernley, Nev. Rudolf Miller.

When to Put Bees Into Cellar. Wintering has not proved to be much of a problem, as I have a good cellar underneath the house. The worst thing to determine is when the bees have had their last flight, as after that they are ready to go into the cellar. I have guessed wrong on the last flight more than once, but last year I decided to wait and give them just one more chance. After the supposed last one which occurred in November, there were a few days during the week when the bees did not venture out. But the following Sunday was bright and sunny, and the little fellows were out by the score enjoying the warm rays. Oh, how I loved to see that last flight! And it was the last one, for a few days later there was something in the air,

that spoke to my ears for the first time since the warm season. So the bees went into the cellar and came in just at the right time, it seems, for there was no flying weather afterwards.

A. G. Sylvester.

Cokato, Minn.

Removing Pollen From Combs. In one of my articles published recently in

Gleanings the practice of rendering into wax all combs clogged with pollen was described. E. M. Cole of Audubon, Iowa, immediately wrote me describing the following method of saving such combs:

"Using a hive-tool, I scrape the pollen-filled cells down well into the pollen, taking care not to injure the base of the cells. With dry brittle comb, the cells may be broken down until most of the pollen can be shaken out. A minute or two is all the time it takes, and I have had a comb of gummy pollen cleaned out and pretty well drawn in 24 hours. I believe they dig out the pollen because they cannot repair the cells until they do."

I told Mr. Cole we would test this method and report results. We tested it on something like 30 combs. After scraping down the pollen as described, we placed one or two such combs in the middle of each brood-nest needing space for the queen, right in the height of the season. On the next round nearly every one was filled with eggs or young brood, the queen having accepted them, if anything, better than she would empty combs. This little "kink" should be of great value to beekeepers, who are sometimes "blessed" with an oversupply of pollen. The time factor is less than that required for rendering into wax.

Georgetown, Ont. Morley Pettit.

The Difference in Yield of Honey. I gave a hive with starters, one inch, to a swarm

with a virgin queen on August 8. The morning of August 9 I placed them on the scales. In the evening of that day they weighed five pounds more than in the morning, but during the night they reduced it one pound. The next day they gained five and a quarter pounds and reduced it at night three-quarters pound and the next day five and a quarter pounds with one pound reduction at night. I kept this up until the comb was fully drawn when I placed a super of drawn combs on the hive and the same experiment was continued, but the weights ran from ten pounds to twelve and a half pounds per day, with one and a half pounds to two pounds reduction at night.

Myron Pickering.

Crane, Mont.

THE new Italian 10-cent time copper coin has on one side an embossed figure of a worker bee sipping nectar from a flower. We are indebted to Dr. Alberico Molinari, Terre Del Greco, Italy, for two of these beautiful coins, which indicate the appreciation of the Italian Government—appreciation of the worth of the honeybee.



spoke at several beekeepers' meetings, describing the methods in honey production in Canada and the United States. His lectures were greatly

appreciated by British beekeepers.

* * *

The Domestic Beekeeper, which was formerly the Beekeepers' Review, has gone back to the old name given by its founder, W. Z. Hutchinson, in 1888. The arrival of the September issue, with the familiar title, "The Beekeepers' Review," seems like the return of an old friend.

* * *

Geo. W. Dial, formerly with the A. I. Root Co., has taken active charge as manager of the Michigan Honey Producers' Exchange. His address is 7739 Linwood Street, Detroit, Mich.

* * *

C. A. Hatch of Richland Center, Wis., well known among beekeepers as the inventor of the Hatch wax press and a former contributor to this journal, died on Sept. 19, at his home in Wisconsin.

* * *

The Canadian Horticulturist and Beekeeper was changed to The Beekeeper on Sept. 1, and is now devoted solely to the interest of beekeepers. It will be published at Petersboro, Ontario, as heretofore.

* * *

The annual convention of the Chicago Northwestern Beekeepers' Association will be held in Room 1811, Hotel La Salle, Chicago, Dec. 5 and 6, 1921. Write to John C. Bull, Valparaiso, Ind., secretary, for a program.

* * *

The annual meeting of the Michigan State Beekeepers' Ass'n. will be held in Lansing on December 1 and 2. A good program is promised. Among the notables to appear will be a representative of the American Honey Producers' League.

* * *

The Montgomery County (Ohio) Beekeepers' Association is planning to hold its next meeting at the grave of L. L. Langstroth in Woodland Cemetery, Dayton, Ohio, on Nov. 5. Mrs. Anna L. Cowan, daughter of Langstroth, is expected to be present at this meeting.

* * *

The Western New York Honey Producers' Association will hold its annual fall meeting at the Genesee Hotel, Buffalo, N. Y., on Tuesday, Nov. 15. A good program has been arranged and all beekeepers are invited to attend. J. Roy Lincoln, Pembroke, N. Y., is secretary of this association.

* * *

Professor F. Eric Millen, Provincial Apiarist of Ontario, has just recently returned from England, where he spent a part of his summer vacation. While in England he

The Ontario Beekeepers' Association are holding their annual convention on Tuesday, Wednesday, and Thursday, Nov. 22, 23, and 24, in Toronto. The convention will be held at the same time as the Royal Winter Fair. An excellent program is in the course of construction, and the Hon. Manning Doherty will address the beekeepers on "Marketing." Other prominent speakers are expected to be present. Full particulars may be obtained from the secretary, F. Eric Millen, Apicultural Department, O. A. C., Guelph, Ont.

* * *

The Crop Report Committee of the Ontario Beekeepers' Association met in Toronto on Tuesday, Sept. 27, to consider the Dark Honey Crop Reports. Three hundred and twenty-nine reports were received in time for the committee's meeting. The total dark honey reported was 395,445 pounds from 16,817 colonies, an average of 24 pounds. The committee recommends 9 to 11 cents wholesale as the price for dark buckwheat extracted honey. The reports showed that the light honey has moved freely at the prices recommended by the Association Crop Report Committee.

* * *

Definite announcements have been made of a circuit of short courses in beekeeping in which Dr. E. F. Phillips of the Bureau of Entomology, Washington, D. C., and Geo. S. Demuth, Editor of Gleanings in Bee Culture, will take part. The first of these will be held at Fort Collins, Colo., during the week beginning Nov. 21; the second at Grand Junction, Colo., during the week beginning Nov. 28; the third at Los Angeles, Cal., during the week of Dec. 5; and the fourth at Berkeley, Cal., during the week beginning Dec. 12. Frank Rauchfuss, Wesley Foster, and Kenneth Hawkins are among the speakers announced for the two short courses in Colorado; and J. D. Bixby, Geo. A. Coleman, Willis Lynch, Fred Hanson, and Cary W. Hartman for the California short courses. Full particulars may be had

concerning these short courses by writing to the Colorado College of Agriculture at Fort Collins and the University of California at Berkeley.

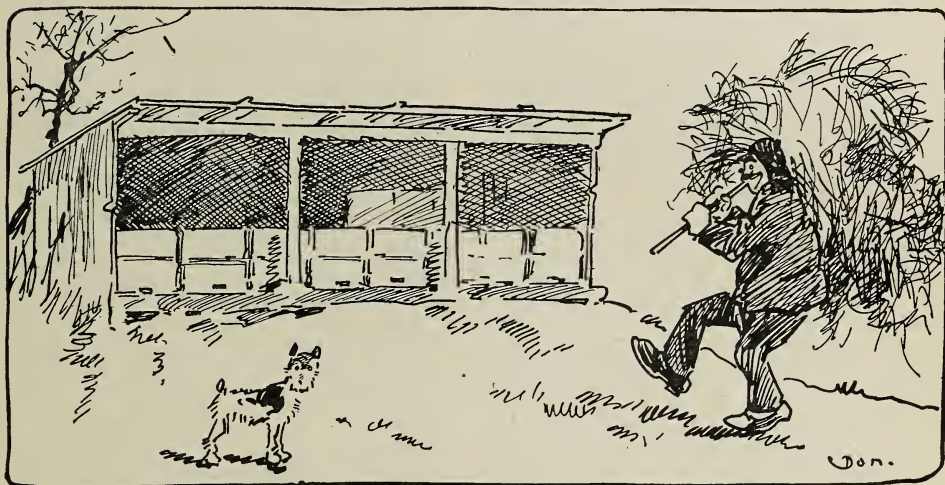
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The Alabama Beekeepers' Association held its annual convention at Montgomery, Ala., on Sept. 22. The meeting was large and enthusiastic. The danger of foul brood getting into the State and the need of foul-brood legislation were laid before the members. At a later meeting, held at Bay Minette, Sept. 28, a committee consisting of the executive officers of the association was appointed to see what could be done toward getting emergency legislation at a special session of the legislature, to be held soon. More bees and queens are reared within 150 miles of Montgomery than any other equal section of the United States. It was, therefore, deemed important that Alabama have a good foul-brood law.

On Oct. 7 there was held at Gainesville, Fla., the second annual meet of the Florida State Beekeepers' Association. This was an enthusiastic gathering called for the purpose of determining how beekeepers might co-operate among themselves in disposing of their honey. Pres. J. W. Barney, in an enthusiastic address, explained how it is possible for the beekeepers of Florida to convert some of their low-grade honeys that are having slow sale into bees and queens, for which there is an active demand. Florida, he said, would have the advantage of Alabama and other States further north by at least from two to three weeks in early delivery. A committee was appointed to see what could be done in formulating plans for furnishing bees to the northern market in March and early April. This association has the active support of Dean Wilmon Newell of the Agricultural College at Gainesville.

When Bees are Packed for Winter.—By Bill Mellvir

(With apologies to Walt Mason.)



When the bees are packed for winter and the honey crop is sold, and the leaves begin to rattle, and the wind is getting cold, and the mornings crisp and frosty when a fellow leaves the hay, and the sun each day is lower, sending just a slanting ray, then I feel quite young and coltish since the season's work is done. Tho I've toiled and sweat and worried, I have had a lot of fun. And it's great to be a-living on a morning crisp and cold when the bees are packed for winter and the honey crop is sold. Say, this world sure is a dinger with its buoyant atmosphere, when the heat of summer's over and the bracing fall is here. So on frisky legs I'm prancing as I chant this lusty rhyme, for a voter should be happy when his work is done on time. Sure I'll miss the

daily troubles and the humming of the bees; miss the big extractor's whirring and the little motor's wheeze. But I'm fit as any fiddle as my aching arms I fold when the bees are packed for winter and the honey crop is sold. Foolish ginks will put off packing, till the snow and ice are here. Some will let it go all winter, paying for it mighty dear. Spring will bring great disappointment to the rusty shiftless jay who neglects such simple duties, loitering from day to day. Black remorse for things neglected, can not bring dead bees to life that have burned their lives out early in the deadly winter strife. I've insured my bees 'gainst freezing, and a policy I hold when the bees are packed for winter and the honey crop is sold.

QUESTION.—Will a pound of dry sugar fed as syrup make more or less than a pound of sealed stores if none of it is used in comb-building? How much more or less?

Indiana.

John Longaker.

Answer.—Much depends upon the time the feeding is done, as well as upon the manner in which it is done. If it is done before brood-rearing ceases, it may stimulate additional brood-rearing, thus causing the bees to use a large portion of the syrup in feeding the additional brood. This is especially the case if the syrup is fed slowly or a little at a time, or if it is made quite thin so the bees are compelled to ripen it. Under such conditions the bees sometimes consume half or more of the syrup as it is fed.

On the other hand, in feeding for winter, if the feeding is postponed until after brood-rearing has ceased and at the time the bees naturally begin to carry honey from the more remote parts of the hive and store it in the empty cells where it will be within the cluster, loss in feeding will be slight, especially if a thick syrup is given while still hot and the feeding is done in such a manner that it is all taken down and stored within a few hours. By taking advantage of the natural instinct of the bees to transport thick stores to the inner portion of the winter nest after the brood has emerged, the bees do not waste much of their energy and food.

In practice, it will be well to count on as many pounds gain in weight of stores when a heavy syrup is fed (not less than two parts of sugar to one part of water) as there are pounds of dry sugar, but when the feeding is done as indicated each pound of dry sugar will result in more than a pound of stores. Just how much more will depend upon how rapidly the bees store it. If the hives are packed when the feeding is done, and the packing is placed around the feeders to keep the syrup warm, there will be but little loss in weight resulting from the bees handling the syrup.

FOOD VALUE OF HONEY.

Question.—What is the amount of calories in one pound of honey in the comb? What is extracted? What about the vitamins in each?

West Virginia.

T. K. Massie.

Answer.—The energy value of honey is usually given as 1485 calories per pound. This figure is for extracted honey. The number of calories in a pound of comb honey would be slightly less since the weight of the wax must first be deducted, the wax not being digestible. Experiments conducted by Philip B. Hawk, Jefferson Medical College, indicate the presence of distinct amounts of vitamins in comb honey, especially the fat soluble vitamin. In these experiments the animals which were being

GLEANED BY ASKING

Geo. S. Demuth

fed, grew about as well on comb honey as when 5 per cent of butter was added to their diet. Butter is known to be rich in the fat soluble vitamin.

WHAT IS NOSEMA APIS?

Question.—Will you please state in detail just what *Nosema Apis* is?
Pennsylvania.

Ralph Gaston.

Answer.—*Nosema Apis* is the name applied by Zander (1909) to a parasite sometimes found in the walls of the stomach of the honeybee. The disease brought about by this infection is called *Nosema* disease. This disease of adult bees is not considered a particularly serious disorder in this country where it is widely distributed and often found in colonies which appear to be healthy. In 1912 and 1913 Graham Smith and others put forward *Nosema Apis* as the cause of the Isle of Wight disease, but in 1919 Anderson and Rennie and Rennie and Harvey succeeded in establishing that *Nosema* infection is not found in Isle of Wight disease but is the cause of a distinct malady. A similar conclusion had been drawn by Dr. White in this country in 1918.

TEMPERATURE OF HONEY FOR BOTTLING.

Question.—When heating honey for bottling should the water in the tank which surrounds the vessel containing the honey be permitted to boil?
New York.

William Dermody.

Answer.—No. The water should not be above 180°F. If it is permitted to boil there is great danger of scorching the honey. The honey itself should not be heated above 160°F. and should not be held at this temperature long, for the flavor of some types of honey will be injured even at 160°F. if kept hot too long.

MOVING BEES FROM NEIGHBORING FARM.

Question.—What is your advice about moving and wintering the bees in box hives which I have recently purchased? They are about a quarter of a mile from my place.

S. W. Martin.

Missouri.

Answer.—It will be better to wait until the bees have been confined to their hives for some time by cold weather before moving them, for, if they are moved such a short distance when they are flying freely every few days, many of the bees will go back to their old location. Even when moved after they have been confined to their hives for three or four weeks, many of the bees will go back unless some precautions are taken to prevent it. This can be reduced somewhat by leaning a board against the front of the hives, before the bees take their first flight after being moved, to cause the bees to stop and look back as they leave the hive so they will notice the change in the surroundings. If it is necessary to move the bees before cold weather, you can prevent their going back by first moving them to a new location three or four

miles away entirely outside of their present range of flight, leaving them there a week or two and then taking them to your place. In the meantime the bees will have forgotten their old home and will stay where you put them. They should be left in the box hives during the winter to be transferred next spring. Transferring is more easily accomplished in the spring, and, no doubt, the bees will winter better if left in the box hives until that time. They should be protected during the winter from strong winds, and for best wintering the hives should be packed as described in this journal last month.

VENTILATION AND THE SIZE OF BEE CELLAR.

Question.—Will five colonies of bees winter in a cellar 8 feet by 4 feet and 5½ feet deep when snowed under all winter and without provision for extra ventilation?

Harold Hanson.

Minnesota.

Answer.—Your little cellar is plenty large enough for five colonies. In fact, you could winter 15 or 20 colonies in a cellar of this size without danger from overcrowding. Usually two square feet of floor surface for each colony is considered ample space for safe cellar wintering if other conditions are favorable. The fact that the cellar is covered over with snow all winter may be an advantage, for it would help keep up the temperature required for good wintering. You do not say whether the cellar is in a loose sandy soil that would permit considerable ventilation thru the soil if the walls are porous, or whether it is in a heavy clay soil. If in a sandy soil you will, no doubt, find that no extra ventilation is necessary. Bees, when wintering well, require but little air because they are quiet, but, if on account of poor food or too low a temperature they become more active, they will of course need more air. It will be well for you to provide a ventilating shaft, which can be closed during the coldest weather if the temperature tends to drop too low with the ventilator open.

HOW EUROPEAN FOUL BROOD IS CARRIED OVER WINTER.

Question.—I have two colonies of Italians that have a few cells of European foul brood. If I unite them and clean up the hive will they get the disease again next spring? If the disease is not in the honey how can it be carried over winter when there is no brood?

C. H. J. Baumbach.

Wisconsin.

Answer.—The disease may appear again next spring, especially if the colony should become weak during the winter or early spring. The fact that no diseased larvae can be found in the fall or at any time when the colonies are very strong, does not necessarily mean that the colony is completely rid of it, for some of the virus may still be lurking in the combs. On the other hand, the colony may be entirely free from the disease next spring.

Experiments conducted by Doctor White, in inoculating colonies with European foul brood, show that if *Bacillus Pluton* (the organism which causes the disease) is present

in honey extracted from diseased colonies it will be destroyed within a few months while in storage. Apparently there is but little if any danger of the disease being carried over winter in the honey. In pollen, however, it remains virulent much longer, in some cases more than 10 months. When dry within the hive, as in a film on the walls of the cells not perfectly cleaned, it would probably remain alive for more than a year, so there is plenty of opportunity for the disease to be carried over winter while there is no brood, even tho no evidence of disease can be seen in the combs. Whether the disease will appear again next spring, therefore, depends largely upon the thoroughness with which the bees clean out the brood-combs. Strong colonies of Italians usually do a more thorough job of cleaning out the cells, which explains how they rid themselves of European foul brood. While *Bacillus Pluton* can remain alive for a long time in a dried film within the hive, if exposed to direct sunlight it will be destroyed within a few hours, so the fragments of the diseased larvae that are carried outside the hive would not be dangerous to other colonies after a few hours' exposure to the sun.

It should be remembered that European foul brood is quite different from American foul brood in its resistance. American foul brood is caused by a spore-forming organism (*Bacillus larvae*), the spores being highly resistant, remaining virulent in the dried-down scales for years and in honey for long periods of time.

BEEKEEPING WHERE AMERICAN FOUL BROOD IS PREVALENT.

Question.—Would it be of any use for me to try to keep more colonies of bees when American foul brood is about?

John Bieseman.

Ohio.

Answer.—You can continue to keep bees in spite of American foul brood in your vicinity just as you continue to keep them in spite of the winters or swarming or any of the many other things that trouble us. Usually only a small percentage of the colonies will contract this disease each season, and by watching for it in its early stages, whenever the colonies are examined, the disease can be detected before it does much damage to the colony. By visiting neighboring beekeepers and showing them how to detect and treat the disease, if they do not already know, the amount of disease in a community can be so reduced that only an occasional case should appear. Such co-operation among beekeepers is, of course, more difficult in towns and cities on account of the difficulty in finding all of one's beekeeping neighbors. Many extensive honey producers are securing good crops of honey year after year in localities where American foul brood is present, and would no more think of giving up beekeeping on account of disease in their neighbors' colonies than the farmer would think of giving up farming on account of the weeds on neighboring farms.

The Dr. C. C. Miller Memorial Fund

An Appeal to Beekeepers Everywhere to Have a Part in Establishing the Miller Library of Beekeeping.



DR. C. C. MILLER

Receipts of contributions for this Fund have been made in the bee journals, and the thanks of the committee which has the fund in charge are extended to each contributor. These thanks are extended in behalf of the thousands of friends of Doctor Miller everywhere, who are anxious that this memorial shall be worthy of the man.

As is well known, the undersigned committee was chosen by C. P. Dadant to act informally in collecting and expending the money to be contributed by the many friends of Doctor Miller. At the time of the first announcements it was quite impossible to tell what form the memorial should take, and as a result the whole matter was presented in quite an indefinite way. Suggestions were made to the committee of various forms in which the memorial could be established. Some desired a monument to be erected at his grave; but this was quite disapproved by most of those with whom we could talk, because it did not seem fitting that Doctor Miller's memory should be perpetuated in such a manner.

Following out the widely approved idea that this fund should be put to work for the benefit of beekeeping for all time, which is the type of memorial that fits the character of our esteemed friend, the most feasible suggestion seems to be to establish a library in which may be collected the books, journals, and reprints of scientific articles on bees and beekeeping, available to those who desire to make special studies in this field. Such a memorial will be less widely available than we would wish, but it follows out the ideas of the many friends who are interested in the fund better than any other that has come to us. This then is what we shall work for.

The location of the library is, of course, still undecided, and the method of management and the safeguarding of the funds for the future are matters which can be determined only after we are able to know how much will be available, but in any event we hope to establish a fund which shall be permanently invested so that the interest shall be used for the furtherance of this library.

For the funds available we know of no more important endowment than this one, for there is today no library in the United States that approaches completeness in this field. There are several excellent private libraries on beekeeping and also several growing institutional libraries of great value, but we hope as the years go by that the Miller Library of Beekeeping will surpass any of them. We also hope that contributions of valuable books and pamphlets will be made so that this Library will grow rapidly.

With this definite plan we make another appeal to the beekeeping friends of the late Doctor Miller to contribute still more liberally than they have to this fund. Many are able to increase their contributions and a still larger number who have not contributed will now, we feel, be anxious to help in this worthy cause. In contributing to a lasting memorial of this kind we not only honor the memory of a great friend but we help in the furtherance of the industry in which we are all so greatly interested. Contributions may be sent to the editors of *The American Bee Journal* and *Gleanings in Bee Culture*, and will be acknowledged thru these journals. May we not ask for greater liberality now that we are able to announce a more definite plan, and may we not all unite in making this a project in which all beekeepers thruout the world may take just pride?

We would also ask that at the meetings of beekeepers for the next few months this project be brought to the attention of those in attendance so that they may have an opportunity to make contributions. Several beekeepers' associations have already taken such action, and in this way liberal contributions have been made. We ask for the hearty co-operation of each and every beekeeper in this movement and want each one to feel that this is not merely an effort being made by a committee but that it is a project dear to the heart of every beekeeper everywhere.

C. P. Dadant,
E. R. Root,
E. F. Phillips,
E. G. LeSturgeon,
B. F. Kindig.

WHILE I write we are told there are some over five millions of unemployed people in our land. I think one statement made it seven millions. I do not know whether the statement was intended to apply to men only, but I have not seen anything in regard to the "great army" of unemployed *girls and women*. Here in Medina Mrs. Root finds it a difficult matter to find a woman, young or old, who is willing to come and do washing. She usually has a very good woman who comes quite regularly once in two weeks; but as she is the mother of *five children*, it is sometimes inconvenient for her to come for only about two hours, and at such times there does not seem to be anybody to take her place. Down in our Florida home she did finally get a colored woman to clean house; but her bill for seven hours' work was \$3.50—just *twice* what I paid Wesley for work in the garden.

About 35 years ago, when there was considerable talk about the "great army of unemployed," I wrote a book entitled "What to Do, and How to Be Happy While Doing It." I think we printed about 10,000 copies, and they have all been sold with the exception of about two dozen. I hope they are still doing good. In that book I tried to point out something for idle men or idle women to do. It was mostly along the line of making garden, keeping chickens, etc. After reading a part of the book today, I still think my instructions were sound. If the man who is out of work has a little place of his own (as every man with a family should have), let him go to work making garden or fixing up that little home. When the people around him can see that he is both busy and industrious, and skillful as well (especially the latter), somebody will have something for him to do. I am scanning the dailies now every day to see what our Government is doing to find work for the unemployed, and I am pleased to note that making better roads has been suggested. After the trip that Ernest and I made a year ago from Ohio to Florida, we certainly are prepared to appreciate *good hard roads*. I now enjoy riding over such a road, in a way I never could have done had it not been for that trip; and it is a part of everyday prayer (or *almost* every day), that God will bless the efforts that are being made to make it easier for the farmers to get the product of their toil up



Whatsoever thy hand findeth to do, do it with thy might.—ECC. 9:10.

In the sweat of thy face shalt thou eat bread.—GEN. 3:19.

I have been young, and now am old; yet have I not seen the righteous forsaken nor his seed begging bread.—PSALM 37:25.

nearer the consumer. Nothing is more needed just now than short cuts along that line. Good roads will help it more than almost anything else.

On page 582 of our September issue is something about what I discovered years ago; and that is, womankind *can* do almost any

kind of work that men can do; and not only that, in a good many cases, they do it even better. When the war took the men away, our factories and great offices discovered that women and girls, especially the stenographers, could get along very well in the absence of the men. Now that the war is over these good women have been a little reluctant to give up their places in the great business world; and my impression is that many of the *employers* have been reluctant about asking them to step "down and out." This is *one* reason for those five millions of workmen being unemployed.

Just one more thing while I am about it: The girls and women do not use cigarettes, nor tobacco in any form. They are more tidy in their habits; they take better care of their surroundings; they do not fill the room with smoke; they do not gossip (I am not overstating this matter, am I?); they do not tell filthy stories; and last, but by no means least, they are not absent from business on Monday morning on account of having been out on a spree the day before.

As you know, there are various organizations just now up in front in regard to doing something for the unemployed. I think our good President Harding has been conspicuous in the movement. Investigation has been made as to the reasons *why* these men could not get a job. I have not at hand the result of these investigations; but I think the greater part of these unemployed men are not skilled workmen. They are not even day laborers, accustomed to good strong muscular work. I remember hearing of one man, who seemed to be a fair sample, when interviewed and offered a job, before accepting it, said he wanted to know what he was to do, what pay he would get, and how many hours were to be considered a day's work. As you doubtless all know, I have been employing people more or less all my life. I think the statement was once made by some periodical that I never did a day's work in my life, for anybody else. This statement, however, was a little overdrawn. I remember distinctly riding a horse in my boyhood, to cultivate corn for 25 cents a

day. As a natural consequence, during all these years men, women, girls, and boys have been coming to me wanting a job. Some good men who now stand away up in some of our great cities once worked for me, when they were little kids, for five cents an hour, and one or two for even three cents an hour. We have had many a laugh over it. Sometimes an applicant has said to me in substance, "Mr. Root, if you will show me what you want done I will do the best I can, and *you* may decide what you can afford to pay." My son-in-law, J. T. Calvert, worked in our apiary in just that way, and for a time, he got a raise almost every week until he finally became general manager for the *entire A. I. Root Company*. I have tried all along these years starting tramps at work who claimed that they could not get a job; but the greater part of them, I soon discovered, were not very anxious to get a job at fair wages. By the way, it just now occurs to me what a tremendous difference there is in humanity in this matter of finding something to do. Just think of it! a full-grown man with average intellect unemployed because there seems to be no chance to do honest work, and at the same time, right near, perhaps in his next-door neighbor we find a man like Ford who employs men by the thousands, paying them unheard-of wages, and at the same time is a blessing to the whole world in this matter of transportation. Our doing away with intoxicants and opiates is certainly going to be a great help.

I have not touched on the matter of strikes in the above; but while I agree that it is certainly right and proper for workingmen to have some sort of union, it certainly is neither right nor Christianlike for any man, who sees fit to refuse the pay offered him, to stand in the way, or to put stumbling blocks in the path, of those who would be glad to do the work and receive the pay that he has declined to accept.

THE HIGH COST OF LIVING, THE HIGH COST OF GETTING SICK, AND THE HIGH COST OF DYING.

Something About a Still Shorter Cut Between Producer and Consumer.

Mrs. Root and I lately stepped into a Medina grocery. After making our purchases we both noticed a very attractive package on top of a glass showcase, labeled "Graham Crackers." Now, I am great on everything graham; but I want the pure wheat—not any sugar nor anything else. I think this attractive package read something like this: "Ninety-nine per cent pure wheat." I asked the grocer if they were sweetened. He said they were not, and so we took the package. When we reached home I also read, "6½ ounces net." The price was 20 cents. You can readily figure that we paid about

50 cents a pound for our graham crackers, where the real wheat ("99 per cent pure") brings the farmer, just now, less than 3 cents a pound. How is that for economy in the household, or to reduce the high cost of living? The producer gets less than 3 cents, and the consumer pays close to 50 cents a pound.

Yes, I have had this matter up before; but, God helping me, I am going to keep bringing it up for several years yet. The graham crackers are not alone; almost everything you buy at the grocery, especially if it is put up in small attractive packages, is a good deal in the line of that little package. You pay for the pasteboard, you pay for expensive printing, you pay for handling; and if you will go into the groceries and investigate, as to almost everything put up in packages, you will find the same result.

Down in Florida last winter the only oyster crackers we could get were 30 cents a pound in bulk. If you bought Uneeda biscuits or any other kind of crackers in *packages* the price was more than 30 cents a pound. Later the crackers came down to 25 cents, and I do not know but one store made a specialty of some kind of crackers in bulk for only 20 cents. I sent to Sears, Roebuck & Co. for a 12-pound box of very nice crackers, and they cost only 14 cents a pound; but the freight was so much, even with a lot of other stuff, that it was not much of a saving after all. Today (Oct. 5) at a "cash and carry" grocery, right across the railroad tracks from our factories, very nice oyster crackers are only 14c per pound.

Now, where is the remedy? I do not propose to make a kick against our grocers or anybody else unless I have something to offer in the way of a remedy. Grind your wheat in your own home in a coffee-mill. If there are not "kids" enough in your family, either boys or girls, to turn the mill, have it done by means of an electric motor or a little cheap gasoline engine. By the way, you will not need any more ingredients to make a most wholesome and appetizing substitute for either bread or crackers. You *can* boil the wheat *whole* until it cracks open; but this takes a lot of time and considerable fuel, and therefore it is a saving all around to grind the wheat. Just crack it and it will cook very much quicker. "Cracked wheat" has been so much talked about for years past that I do not need to elaborate.

I have been having quite a lot of automobile rides lately thru the country, and I have kept saying "thank the Lord" mentally, even if I did not say it out loud. Do you know why? Well, just of late we have been enjoying a beautiful macadam road between Medina and Cleveland. No matter what the weather is, my little electric auto spins like a top up hill and down. Well, since this good road was finished there is an almost constant stream of automobiles

to and fro; and the farmers who have apples or peaches or anything else to sell, have their produce in neat and attractive packages on a little stand placed on a pretty piece of green lawn close to that beautiful highway, with prices in plain print. If no one is in sight, just toot the automobile horn, or whatever it is, and somebody will wait on you. Mell Pritchard's son is selling honey in the same way, and just lately he has been putting up some little boards on top of a stake, maybe a yard high, with just the one word on it—"HONEY." These little signs are strung along the highway for a mile or more in each direction. One objection that has already been made is that there are more automobiles passing on Sunday than on any other day; and a great part of the Sunday people would like to buy stuff on Sunday as well as week days. I hardly need tell you that I object to anything on Sunday that calls for money back and forth, unless it is a restaurant for regular meals. One of these signs near the city of Cleveland has a notice in plain black letters, "No sales on Sunday."

Last winter, when Huber and I ran over a considerable part of Florida, we found oranges and other fruit in attractive baskets, more or less all along the improved highways. Here is another argument for good roads. Just think and consider, and not only consider but *act*, dear friends. Instead of paying fifty cents for what need not cost over three cents, help the world by example and precept in making a *still shorter* cut between producer and consumer. Stop buying stuff in little fancy packages. When you are taking an outing in an automobile, and wish to have a picnic supper or dinner, 20 cents for a few crackers with some fruit and cheese to go with it may be all right, as it saves time. But when you undertake to keep a family and buy your food in little packages as I have indicated, just remember what your old friend A. I. Root has said about it.

I wonder if somebody will not rise up right here and say, "Mr. Root, what about Airline honey," My reply is, do the same way, by all means, in regard to honey. Hunt up the beekeeper, and, instead of asking him to put it up in little tumblers, buy a five-gallon can or if you do not want to buy so much, say a ten-pound can. Honey, for safety, must be put up in expensive glass or tins, and these are heavy to ship. Honey should *not* be sent long distances. There ought to be a beekeeper within, say, ten miles of every home, and you can take your automobile and go and get it. If you persist in going to the groceries and buying it a tumblerful at a time, let me be frank and tell you what you will have to do. I do not propose to screen myself nor our industry here at Medina. You know, perhaps, we buy honey by the carload, and a good many times these carloads come from away off in California or some other great distance. We

have just received a carload of mesquite honey from Arizona. We paid the beekeeper 6½ cents a pound for it; but we had to pay the expensive freight all the way from Arizona. Then in order to give the proper blend and color we had to put in some better and whiter honey with it—usually our northern white clover honey—to bring it up to grade and quality as well as color. Then this honey is sometimes shipped as far as the carload was shipped in the first place from Arizona. When it gets into the grocery, far away from Medina, I should not wonder if the grocer finds that 75 cents for a 3-lb. can or jar is the best he can do.

I have been telling you repeatedly in my Home papers that I started out almost 50 years ago to put the serving of humanity *first*, as my object in life, and serving A. I. Root, in the second place.

Just a word more about your grocer. Please do not think that I am putting the blame all on him. The grocer, as a rule, furnishes what his customer calls for. Mrs. Root and I have just used up a package of oatmeal. I figured up that it cost us 12 cents a pound in a fancy package. I said to our grocer, "Have you oatmeal in bulk?"

"Sure," he replied.

"How much a pound is it?"

"Six cents."

There you have it. A great part of our daily food is kept by the grocer in bulk as well as in fancy packages; and in fancy packages it costs twice as much, or even more than that, and yet the people pay the big price just on account of *looks*, while at this very time they are starving by the millions, not only in China but away off in poor Russia. Let me go over it briefly again.

Wheat ground in the coffee-mill costs you 3 cents a pound or less; made into crackers and put up in fancy packages it costs 50 cents a pound. Perhaps the graham crackers are an extreme; but there are a great many other things in the same line. And a sadder thing on top of all of it is that a lot of people—yes very likely you and I—are "digging our graves with our teeth" by eating *more* than is *good* for us, with little or no thought of the starving millions.

Good friends, if you will look at my heading you will see it includes something about the cost of getting sick. I told you a year ago about the examination they gave me at Battle Creek. Well, the dear children (grandchildren and all, as well as myself) think it best that I should be examined at least once a year by a competent physician. In the great city of Cleveland there are, of course, a great many doctors—yes, and a great lot of "high-priced" doctors. Just a little while ago I heard of one Cleveland doctor who does not use any medicine at all. And he does not send one to any drugstore to pay out ever so many dollars for "prescriptions." If I remember correctly some of the drugstores have been ac-

cused of charging *almost* as big profits (?) as that graham-cracker episode—50 cents for 3 cents' worth of wheat.

A good friend of mine went to a prominent physician, and this doctor gave him a prescription to be filled out at the drug-store; and he said, in referring to it in a joking way, "There was enough medicine to *kill* a horse if he had taken it all."

Well, this Cleveland doctor, when he caught sight of me, began to laugh. By the way, in years gone by he was one of my Sunday-school pupils. He said something like this:

"Mr. Root, some thirty or more years ago you recommended pretty vehemently a hot-water enema in place of pills and physics. Later on you told us that you made a mistake in advising the use of it every day, saying that it should be used only occasionally when there are indications that the bowels do not have the thoro cleansing which they should have. The leading physicians of the great wide world are just now pretty unanimously getting around to your teachings of years ago. *Pills and physics* are to be a thing of the past."

First he congratulated me on being in such excellent shape for a man of 82; and then, touching my forehead, he added, "Especially in being able to give the world these Home papers apparently about as well as you ever did when 60 years old instead of 82." He said my troubles which sent me to him were probably caused by tardy or imperfect bowel movement; that the same cracked wheat that I have been talking to you about was the very best remedy—much better than bran put up in fancy packages or anything else of that sort. Then there is one more important thing. All machinery, when it becomes old, must have a lubricant, and more and a better lubricant. He said that old men and women are just like machinery. Years ago Dr. Salisbury said to me the human body needs to be kept "well greased;" and I think he recommended castor oil. Dr. Bishop said that butter, bacon, and animal fats of all kind are well enough for lubricating, but that old people in particular need a lubricant that is neither *animal* nor *vegetable*. He said we are just now getting hold of a *mineral* lubricant made from crude oil. I think you can get this at any drugstore, made specially for medicine. He said, "At first take, at night, a tablespoonful or more; but after a thoro cleansing movement has been secured take a little occasionally as needed."

A good rule is to take enough so that the toilet papers will look a little greasy. He added further that my outdoor exercise was the thing; and going to Florida winters in order to have this outdoor exercise was also the *right* thing. In regard to diet, he said that men and women over 80 years of age should be fed about as we feed a baby. Fruit is all right; but, as a rule, it should be well cooked; and last, but by no means

least, old people should sleep about as often as a baby sleeps—say a good nap shortly after every meal; and that is just about what I have been having. Have meals regularly; let there be no eating of anything of any sort between meals; and have the sleep, as far as possible, at regular hours, not only to the hour, but, if possible, almost to the minute.

I was intending to say something about the high cost of dying; but this paper is already too long. Mrs. Root suggests that the very cheapest coffins you can get here in Medina cost \$100. These coffins are never exposed to public gaze for more than a few hours. I would suggest a plain wooden box made of the cheapest kind of material. To hide its unsightliness during the brief time it is exposed to view, cover it with some cheap paper, and take the money thus saved to feed the starving babies and poor mothers who seem to be dying from lack of nourishment in some parts of this world of ours almost every day and every hour. Use some of the money thus saved for putting up a decent tombstone which can be visited by the descendants for years to come, and have some appropriate lettering as a reminder of the life of the departed one; and also do your part in keeping the cemetery in decent-looking order. Some one has said that the best indication of the way in which a town or city is managed and kept up to date is shown by the appearance of the cemetery.

HUBAM CLOVER AND WHAT IT MAY DO AS A FIELD CROP.

By Prof. Hughes (himself)

The extent to which Hubam will come to be used as a field crop will depend largely on the growth which it makes following the small grain crop when seeded with the small grain in the spring. We are trying to get together just now as complete information as we can from all parts of the country on this particular phase of its growth. I had an excellent report this morning from central Wisconsin, where when seeded with barley it had made a growth of over two feet following the removal of barley, and produced a great mass of material for plowing under. This report came from Melvin Haines at Sawyer, Wis. He writes that he is nearly a hundred years old and a retired farmer, and will not be able to use it much himself; but wants to leave something to his friends and neighbors and has great faith in this clover. Altho the writer was a retired farmer, he tells me that he is an extensive grower of cherries, and that they have marketed 350,000 cases of sour cherries this year.

In a letter from my father received yesterday from northern Illinois, he states that the Hubam seeded with the winter wheat made a growth of over four feet following the removal of the winter wheat crop, and that it is still growing rapidly; that it has outgrown ragweed, pigweed, tumbleweed, and everything else, making over eight times the growth of other clovers seeded under the same conditions. Another report, received a few days ago from Iowa, reports a perfect mass of material following winter wheat with a growth of four feet there.

There are, of course, a few individuals here and there who feel it their duty to warn the public that Hubam clover really has no value, and when these occasionally come to our attention, you can imagine how much we appreciate the support of such men as yourself, your son, and Mr. Collingwood and others.

Very sincerely yours,
Newbern, Ala., Oct. 4, 1921. H. D. Hughes.

Classified Advertisements

Notices will be inserted in these classified columns for 50c per line. Advertisements intended for this department cannot be less than two lines, and you must say you want your advertisement in the classified column or we will not be responsible for errors. Copy should be received by 15th of preceding month to insure insertion.

REGULAR ADVERTISEMENTS DISCONTINUED IN GOOD STANDING.

(Temporary advertisers and advertisers of small lots, when discontinued, are not here listed. It is only regular advertisers of regular lines who are here listed when their advertisements are discontinued when they are in good standing.)

H. C. Lee, Dr. White Bee Company, Virgil Weaver, C. D. Townsend, T. J. Talley, I. J. Stringham, Robert B. Spicer, F. A. Salisbury, F. M. Russell, G. Routzahn, Chas. Reynders, J. P. Moore, J. F. Moore, G. H. Merrill, C. A. Mayeux, J. J. Lewis, F. W. Lesser, E. L. Lane, Adam Kalb, Jensen's Apiaries, J. D. Harrah, D. W. Howell, Jos. Hanke, Greenville Bee Co., C. I. Goodrich, J. F. Garretson, Foster Honey & Merc. Co., C. S. Engle, F. R. Davis, R. O. Cox, Mrs. Alice Burrows, Bee-dell Apiaries.

HONEY AND WAX FOR SALE

FOR SALE—Amber honey in 60-lb. cans. P. W. Sowinski, Bellaire, Mich.

FOR SALE—Buckwheat honey in 60-lb. cans. Bert Smith, Romulus, N. Y.

FOR SALE—White and amber honey in 5-lb. pails, packed in cases of 12. R. C. Wittman, St. Marys, Pa.

FOR SALE—A ton of extracted honey suitable for baking purposes. E. D. Townsend & Sons, Northstar, Michigan.

FOR SALE—Clover, basswood, or buckwheat honey, in 5-lb. or 10-lb. pails, or 60-lb. cans. H. B. Gable, Romulus, N. Y.

FOR SALE—Finest clover honey. Packed in new 60-lb. cans and 5-lb. pails. Sample 15c. A. C. Ames, Weston, Ohio.

FOR SALE—Finest quality clover-basswood and buckwheat honey, 5, 10, and 60 lb. tins. H. F. Williams, Romulus, N. Y.

FOR SALE—8000 lbs. choice white clover extracted honey. Sample 20c, applied on first order. C. H. Hodgkin, Rochester, Ohio.

FOR SALE—Extra fine white clover honey in new 60-lb. cans, two to the case, at \$15.00, f. o. b. Ruthven, Iowa. Martin Carsmoe.

FOR SALE—New crop buckwheat honey in 60-lb. cans, two to the case. D. L. Woodward, Clarksville, N. Y.

FOR SALE—Choice clover honey in new 60-lb. cans, all produced on new combs. Sample 20c. W. B. Crane, McComb, Ohio.

FOR SALE—White clover honey, almost water white. Put up in new 60-lb. tin cans, two to the case. Write for prices. D. R. Townsend, Northstar, Mich.

FOR SALE—12,000 lbs. of choice white clover honey in 60-lb. cans at 15c per lb., f. o. b. Brooksville, Ky. Sample 25c. W. B. Wallins, Brooksville, Ky.

FOR SALE—Choice clover honey, 15c; buckwheat, 10c per pound. Two 60-lb. cans to case, f. o. b. here. Wm. Vollmer, Akron, N. Y.

FOR SALE—White honey in 60-lb. cans, also West Indian in 50-gal. barrels. Sample and price on request. A. I. Root Co., 23 Leonard St., New York City.

FOR SALE—New crop extracted honey. Put up in new cans and cases. This honey extracted from sealed combs and is of finest quality. Also have comb honey. Gelsner Bros., Dalton, N. Y.

FOR SALE—Fine quality light amber honey, over half clover. Put up in 5-lb. pails, packed in barrels. Heated to prevent granulation. Price right. The Scott Apiaries, LaGrange, Ind.

FOR SALE—Amber honey in 60-lb. cans and 160-lb. kegs, at 8c per lb.; 2000 lbs. of clover and basswood honey 1920 crop at reduced prices in 60-lb. cans. Geo. M. Sowarby, Cato, N. Y.

FOR SALE—Extra choice extracted white clover honey, put up in 60-lb. cans and 5-lb. lithographed pails. Sample 20c. Same to apply on first order. E. J. Stahlman, Grover Hill, Ohio.

FOR SALE—Clover, basswood, or buckwheat honey, comb and extracted, by the case, ton, or carload. Let me supply your wants with this fine N. Y. State honey. C. B. Howard, Geneva, N. Y.

FOR SALE—Several thousand pounds of the finest quality clover extracted honey. New cans and cases. None better produced. Howard Townsend, Northstar, Michigan.

FOR SALE—Extra choice extracted white clover honey, put up in new 60-lb. cans and 5-lb. pails. Sample 20c, same to apply on first order. David Running, Filion, Mich.

HONEY FOR SALE—In 60-lb. tins, water-white orange, 14c; water-white clover or white sage, 12c; extra L. A. sage, 11c; N. Y. State buckwheat, 10c, for immediate shipment from New York. Hoffman & Hauck, Inc., Woodhaven, N. Y.

FOR SALE—White honey, 15c a lb.; L. A. alfalfa, 14c, in two 60-lb. cans; Chilian in 165-lb. kegs, 10c; light amber honey in 50-gal. bbls., 80c a gal. Beeswax, 30c a lb. Walter C. Morris, 105 Hudson St., New York City.

FOR SALE—500 cases buckwheat and goldenrod comb honey. Will average 22 lbs. to the case of 24 sections, \$4.50 per case, f. o. b. here. For 50 cases or more write for prices. Edgar Williams, Pierpont, Ohio.

FOR SALE—New crop choice clover extracted honey packed in NEW cans and cases at \$14.85 per case of two 60-lb. cans. A few cases of last year's clover honey at 10c. Write for price on 10 or more cases of new honey. J. D. Beals, Oto, Iowa.

YOU only have to buy 600 pounds of E. D. Townsend & Sons' fine clover extracted honey to get their very lowest wholesale price this year. If your customers require the best, write them at Northstar, Michigan, for their price.

FOR SALE—No. 1 white comb honey, \$6.00 per case; No. 2 white comb, \$5.00 per case of 24 sections; six cases to carrier. Clover extracted, two 60-lb. cans to case, 15c a lb.; clover in 5-lb. pails, \$1.00 each, 12 pails to case. Amber baking honey in 60-lb. cans, 10c; same in 50-gal. barrels, 8c. H. G. Quirin, Bellevue, Ohio.

RASPBERRY HONEY—Blended with a slight amount of willow-herb honey, two of the best honeys of northern Michigan. It was all thoroughly ripened by the bees. It is good thick body, and fine flavor, none better for table use. It is put up for sale in 60-lb. tin cans. Price for two cans in a case, \$18.00; for one can in a case, \$9.50. Sample by mail, 20c, which may be applied on purchase of honey. Elmer Hutchinson & Son, Lake City, Mich.

FOR SALE—Extra fine well-ripened clover honey in 60-lb. tins, two cans to the case, at \$15.50 per case. Adam Bodenschatz, Lemont, Ills.

FOR SALE—20,000 lbs. 1921 crop extracted honey, left on the hives until thoroughly ripened. Fine quality white clover, 11c; light amber, 10c; amber, 9c, f. o. b. at Marietta. J. G. Burtis, Marietta, N. Y.

I HAVE about 30,000 lbs. of choice sweet clover honey and to get some cash hurriedly I will sell it at 10c per pound f. o. b. Don't think anything wrong because it is cheap, for it is clear and all sealed on hives before extracting, and put up in second-hand cans that are as good as new on inside. Try it. Joe C. Weaver, Cochrane, Ala.

FOR SALE—Extra fine Michigan white clover and basswood honey. Almost water white. Indeed, I doubt if the color, body, and flavor can be beat. Put up in 60-lb. cans, two to the case, at 15c per pound, or in 5-lb. pails, 50 to the barrel, at 17c per pound. Sample 15c. O. H. Schmidt, R. D. No. 5, Bay City, Mich.

FOR SALE—Several thousand pounds extra well-ripened white clover honey, with a slight admixture of goldenrod honey. Color, clear light golden. Flavor mild and delicious. Put up in new 60-lb. cans, two in a case. Price, per case, \$15.00, or 12½c per lb. f. o. b. Merritt. Sample, 15c. Will be applied on order. It pleases my local customers and it will please you. J. H. Corwin, Merritt, Mich.

FOR SALE—A carload of the very finest quality extracted honey. This crop of honey was produced above excluders, in white combs that have never been used for brood; then the entire crop was left upon the hives until some time after the close of the honey flow, so is very thoroughly cured by the bees. It is being put into new 60-lb. net tin cans; in fact, not a single thing has been neglected to make this crop of honey the finest possible to produce. It was gathered from white clover principally, with a very little basswood mixed in it, perhaps 5%. Of course, this fine honey is worth more than ordinary honey and we have to ask just a little above market price for it, so those not having a market that will pay a little more for an extra quality honey, had better not write about this year's crop of honey. E. D. Townsend & Sons, Northstar, Michigan.

HONEY AND WAX WANTED.

WANTED—Bulk comb and section honey. J. E. Harris, Morristown, Tenn.

WANTED—Honey, section, bulk comb, and extracted. W. A. Hunter, Terre Haute, Ind.

HONEY WANTED—Give particulars in first letter. Elton Warner, "Beaverdam," Asheville, N. C.

BEESWAX WANTED—For manufacture into SUPERIOR FOUNDATION. (Weed Process.) Superior Honey Co., Ogden, Utah.

WANTED—Beeswax, also old comb and cappings to render on shares. Will buy your share and pay the highest market price. F. J. Rettig, Wabash, Ind.

I AM in the market for white clover, basswood, or amber honey. Send sample and quote me your lowest prices delivered f. o. b. Preston. M. V. Facey, Preston, Minn.

WANTED—All kinds comb and extracted honey and beeswax. Car lots or less—and full colonies of bees. W. C. Morris, 170 Rossier Ave., Yonkers, N. Y.

WANTED—Shipments of old combs and cappings for rendering. We pay the highest cash and trade prices, charging but 5c a pound for wax rendered. The Fred W. Muth Co., Pearl and Walnut Sts., Cincinnati, O.

WANTED—Beeswax. We are paying 1 and 2c extra for choice yellow beeswax, and in exchange for supplies we can offer a still better price. Be sure your shipment bears your name and address, so we can identify it immediately upon arrival, and make prompt remittance. The A. I. Root Co., Medina, Ohio.

WE BUY honey and beeswax. Give us your best price delivered in New York. On comb honey, state quantity, quality, size, and weight of sections and number of sections to a case. Extracted honey, quantity, quality, how packed, and send samples. Chas. Israel Bros. Co., 486-490 Canal St., New York City.

FOR SALE

ROOT'S GOODS AT ROOT'S PRICES. A. W. Yates, Hartford, Conn.

HONEY LABELS—New designs. Catalog free. Eastern Label Co., Clintonville, Conn.

FOR SALE—A full line of Root's goods at Root's prices. A. L. Healy, Mayaguez, Porto Rico.

ROOT'S BEE SUPPLIES—For the Central Southwest Beekeepers. Beeswax wanted. Free catalog. Stiles Bee Supply Co., Stillwater, Okla.

FOR SALE—200 10-frame comb supers, painted, good as new, also queen-excluders, etc. J. A. Everett, Edgewater, Colo.

PORTER BEE-ESCAPES save honey, time, and money. Great labor-savers. For sale by all dealers in bee supplies. R. & E. C. Porter, Lewiston, Ill.

FOR SALE — "SUPERIOR" FOUNDATION, "quality unexcelled." Let us prove it. Order now. Superior Honey Co., Ogden, Utah.

FOR SALE—Good second-hand 60-lb. cans, two cans to a case, boxed, at 60c per case f. o. b. Cincinnati. Terms cash. C. H. W. Weber & Co., 2163 Central Ave., Cincinnati, Ohio.

SHIPPING CASES—1000 12-lb. three-row shipping cases, 2-inch glass for 4¼ x 4¼ x 1½-inch plain sections. These cases are complete, KD, packed in crates of 50. Price per crate, \$12.50. The A. I. Root Co., Medina, Ohio.

SWEET CLOVER hullers and scarifiers combined, hulls and scarifiers at the same time. Two screens and an extra set of lining included. Price, \$3.50 each, postage extra. S. Rouse, Ludlow, R. D. No. 2, Ky.

WANTS AND EXCHANGES.

WANTED—Will trade queens or pound packages for Barnes saw. V. R. Thagard, Greenville, Ala.

WANTED—A two-frame reversible extractor, at once. State price. Van Collins, Riversville Road, Port Chester, N. Y.

WANTED—Old combs and cappings for rendering on shares. Our steam equipment secures all the wax. Superior Honey Co., Ogden, Utah.

OLD COMBS, cappings, or slumgum wanted for rendering by steam press process. We pay cash for wax rendered, trade for supplies, or work it into foundation. W. T. Falconer Mfg. Co., Falconer, N. Y.

OLD COMBS WANTED—Our steam wax-presses will get every ounce of beeswax out of old combs, cappings, or slumgum. Send for our terms and our 1921 catalog. We will buy your share of the wax for cash or will work it into foundation for you. Dadant & Sons, Hamilton, Illinois.

BEESWAX wanted. Old combs (dry) and cap-pings for rendering. Also wax accepted in trade. Top market prices offered. A. I. Root Co. of Iowa, Council Bluffs, Iowa.

FOR SALE OR TRADE—30-40 Krag high-power magazine rifle, perfect condition. Want beehives or extractor. Charles Thielman, R. D. No. 2, Powderly, Texas.

MAN and wife, expert beekeepers, going south with Ford car. Want Florida apiary on shares or might buy. Will clean up foul brood if necessary. E. W. Brown, Box 117, Willow Springs, Ill.

WANTED—10-frame standard hives and equipment, empty combs (wired) and bees (nearly). To interest must be warranted disease-free, good condition and priced right. L. W. Smith, Madison, N. J. (or 56 William St., New York City).

SEEDS AND PLANTS.

HUBAM clover seed for sale. Get my prices. J. Tom White, Dublin, Ga.

PURE Hubam or white annual sweet clover seed. Oz., 25c; lb., \$2.00. L. B. Harber, Rt. 1, Mt. Olivet, Ky.

HUBAM or annual sweet clover seed (Hughes variety), at reduced prices. Evan Jones, Williams-town, N. J.

BOOKING orders for low bush huckleberry plants. No. 1 extra large blue, No. 2 blue, No. 3 black, at 50c each; \$5.00 per doz. Over 12 doz., \$4.00 per doz. Fill orders until January. Mrs. S. A. Bradshaw, Luverne, R. D. No. 4, Ala.

BEEES AND QUEENS.

FOR SALE—Italian queens, nuclei, and pack-ages. B. F. Kindig, E. Lansing, Mich.

HARDY Italian queens, \$1.00 each. W. G. Lauver, Middletown, Pa.

SEE our large advertisement on page 729 for prices. Buckeye Bee Co., Justus, Ohio.

WHEN it's **GOLDEN**, it's **PHELPS**. C. W. Phelps & Son, Binghamton, N. Y.

FOR SALE—100 colonies bees in lots to suit buyer. Loveland Honey & Merc. Co., Loveland, Colo.

SEE our large advertisement elsewhere. Rosedale Apiaries, J. B. Marshall and H. P. LeBlanc, Props., Big Bend, La.

FOR SALE—68 colonies of bees. No disease. Extractor, supers, and outfit. Write for prices. A. G. Stow, Howard, Kansas.

FOR SALE—Carload bees, nuclei, pound pack-ages, full colonies. See our ad elsewhere. The Stover Apiaries, Mayhew, Miss.

FOR SALE—10 fine colonies of Italian bees in 10-frame hives. Plenty winter stores. Alfred H. Thies, Ferguson, R. D. No. 32, Mo.

FOR SALE—Pound packages and nuclei for May delivery. Write for prices and terms. Safe arrival and satisfaction guaranteed. Tupelo Honey Co., Columbia, Ala.

WE are now equipped to handle your early spring orders for package bees, and Italian queens, especially bred for the production of honey. Prices will be in accord with the reduction in material and labor. Safe arrival guaranteed. Write for prices and terms. Sarasota Bee Co., Sarasota, Fla.

PHELPS' GOLDEN QUEENS will please you. Mated, \$2.00; 6, \$10.00; or \$18.00 a doz. C. W. Phelps & Son, Binghamton, N. Y.

BEEES AND QUEENS from my Carolina apiaries —progeny of my famous Porto Rican pedigreed breeding stock. Elton Warner, Asheville, N. C.

SELECT THREE-BAND and Carniolan queens. Tested, \$2.50; untested, \$1.25. Will accept orders for spring delivery. Geo. W. Coltrin & Son, Mathis, Texas.

FOR SALE—300 colonies bees in 8-frame hives. All have plenty of honey for winter; also a lot of bee shipping cages and supers. Priced right. C. H. Cobb, Belleville, Ark.

QUEENS OF QUALITY for 1922. Three-banded Italians only. After April 15, untested, \$1.25; tested, \$2.00. Satisfaction guaranteed. P. M. Williams, Ft. Deposit, Ala.

1922 PACKAGE BEES AND QUEENS, untested and day-old, in Thompson safety introducing cages. Discounts on early advance orders. James McKee, Riverside, Calif.

FOR SALE—500 colonies in 4 yards, with power extractor, easy terms, near English colony. Very healthful, wonderful flows, local market. M. C. Engle, Herradura, Cuba.

WE are now booking orders for spring delivery of our queens and package bees. Write us your wants and ask for prices. Graydon Bros., Greenville, R. D. No. 4, Alabama.

BEEES BY THE POUND — Also **QUEENS**. Booking orders now. **FREE** circulars giving details. See larger ad elsewhere. Nueces County Apiaries, Calallen, Texas, E. B. Ault, Prop.

FOR SALE—10 hives Italians in good 8 and 10 frame hives, free from disease, with supers and frames. Will trade for Ford or sell outright. Quirin Siefert, Batesville, R. D. No. 3, Ind.

SHE-SUITS-ME queens, season of 1921. Un-tested Italians: After June 15, \$1.50 each, up to nine queens; 10 to 24 queens, \$1.40 each; 25 and up, \$1.25. Allen Latham, Norwichtown, Conn.

AM now booking orders for three-frame nuclei and queens of Dr. Miller's strain for 1922 delivery. I wish to thank my many satisfied customers for their patronage. S. G. Crocker, Jr., Roland Park, Baltimore, Md.

IF GOOD bright Italian queens are wanted by return mail, send your order to M. Bates, Greenville, Ala. Price, \$1.00 each; \$10.00 per dozen; \$75 per 100. Pure mating, safe arrival, and satisfaction guaranteed.

TERMS considered to the right party. Will offer bees to parties being able to give good references. One-half cash and other half payable fall 1922. Will sell only 25 packages or more. Write for price and information. L. C. Mayeux, L. Box 4, Hamburg, La.

EARLY spring delivery, 1922. Three-banded stock only. One Hoffman frame emerging brood, one good untested queen, one pound bees, April delivery, \$5.25 each package. Same as above. May delivery, \$4.75. 5 per cent discount on 25 packages or more; 10 per cent deposit to book your order. L. C. Mayeux, Hamburg, La.

PHELPS' GOLDEN ITALIANS QUEENS combine the qualities you want. They are **GREAT HONEY-GATHERERS, BEAUTIFUL, and GEN-TLE**. Virgins, \$1.00; mated, \$2.00; 6 for \$10.00. or \$18.00 per doz.; tested, \$5.00. Breeders, \$10 to \$20. Safe arrival guaranteed only in the U. S. and Canada. C. W. Phelps & Son, Binghamton, N. Y.

FOR SALE—Root's strain of Golden and leather-colored Italian queens, bees by the pound and nuclei. Untested, \$1.50 each; select untested, \$2.00; tested, \$2.50 each; select tested, \$3.00. For larger lots write. Circular free. A. J. Pinard, 440 N. 6th St., San Jose, Calif.

TO MY CUSTOMERS—Thanks for your valued patronage in 1921. It was our best year but one. With good stock introduced for miles around us, an increased and improved equipment, and 23 years' experience, we aim to give such quality and service as will merit your continued patronage. 1922 circular and price list ready in December. J. B. Holloper, Queen-breeder, Rockton, Pa.

FOR SALE—Package bees for spring delivery, three-band strain, bred for business. 20% cash books your order. Safe arrival and satisfaction guaranteed. A two-pound package of bees and select untested queen for \$5.00; 25 or more for \$4.75 each. Write for prices on larger lots. Caney Valley Apiaries, J. D. Yancey, Mgr., Bay City, Texas.

FOR SALE—Modern equipped apiary in Chicago's wonderful clover belt, 30 strong colonies of Italian bees, packed in winter packing cases. Portable extracting house, reversible extractor, Peterson uncapping melter, honey and wax separator, two-burner gasoline stove, large straining tank. Everything a beekeeper needs. For particulars write or see Anderson Bros., 533 Belmont Ave., Chicago, Ill.

FOR SPRING DELIVERY, 1922—One vigorous Italian queen, one frame emerging brood, one pound bees. Price, complete, f. o. b. Bordeloville, \$5.00. Additional frames of brood, each \$1.00; additional pounds of bees, each \$1.00. Queens introduced and laying en route to you. Safe delivery and satisfaction guaranteed. No disease. Reference given. Orders booked one-fifth down. May delivery. Send for addresses of satisfied customers. Jes Dalton, Bordeloville, La.

FOR MAY AND JUNE DELIVERY—Place your order for our high-grade three-banded Italian bees and queens now. Take advantage of early order discounts by ordering now. We guarantee to please you. Prompt service and quality stock is our motto. We want your orders for bees on Root standard Hoffman frames, emerging bees. Pound packages and nuclei, with or without queens. Write for our prices and valuable information. Oscar Mayeux, Hamburg, La.

CALIFORNIA ITALIAN QUEENS, the old reliable three-banded stock that delivers the goods. Every queen actually LAYING before being caged, and fully guaranteed. I also guarantee safe arrival. **SPECIAL FALL PRICES**, select untested, 1, \$1.25; 6, \$7.00; 12, \$13.00; 25 to 99, \$1.00 each; 100 and over, 90c each. Package bees for next spring delivery. Circular free. California Apiaries, J. E. Wing, Prop., 155 Schiele Ave., San Jose, Calif.

NEW 1922 PRICES—On account of the present price of honey and recent reductions in the price of supplies we are now booking orders for our three-band leather-colored Italians at the following low prices: 2-lb. packages of bees, no queen, \$4.00; untested queen, \$1.25; 12, \$13.50. Select untested, \$1.50; 12, \$15.00; tested, \$2.25; 12, \$20.00. No disease. Safe arrival in U. S. and Canada and satisfaction guaranteed. Write for circular and prices on quantities. J. M. Cutts, R. D. No. 1, Montgomery, Ala.

FOR SALE—1922 bees. Mr. Beeman, send your order early. First arrived, first served. Make shipment April 25 to June 5. Several years' experience. 1-lb. package three-band Italian bees, 1 untested queen, \$5.50. 1st. We use pure sugar syrup; better than honey or candy to ship on; it contains water as well as feed. 2nd. Feeders are made more substantial, 1/2 larger and have screw cap that will not jar out. One-third down and balance just before shipment. Guarantee safe arrival all over U. S. and Canada. A. J. Lemoine, Moreauville, La.

FOR SALE—Pure Italian bees for 1922 spring delivery. Pound packages shipped with stores on Hoffman standard frames. Certificate of inspection with each shipment. Safe arrival and satisfaction guaranteed. 2 lbs. bees, \$4.75; 3 lbs. bees, \$6.25; 1-fr. nucleus, \$3.75; 2-fr. nucleus, \$5.75; add price of queen desired with each package. Untested queens, \$1.00 each after May 1. Tested queens reared during fall 1921 especially for early shipment at \$2.00 each, beginning April 15. 25% books your order. Discount on large orders. J. L. St. Romain, White Clover Farm & Apiary, Hamburg, La.

MISCELLANEOUS.

MEDICINAL roots and herbs are very profitable to grow. We especially recommend growing Golden Seal, which with good care will yield as high as \$10,000 per acre for each crop. It takes several years to mature but will average \$1000 a year. Special Crops, a monthly paper, tells how. Sample copy, 10c; \$1.00 per year. Address Special Crops Pub. Co., Box "G," Skaneateles, N. Y.

WOULD you like to buy your beekeepers' supplies of yourself and have your honey sold for you and all the profits returned? This is what about fifty beekeepers in Michigan and adjoining States are doing. It only costs \$10 per share to be one of the company of producers who are doing this same thing. If you live within a thousand miles of Detroit, Michigan, where we shall maintain a warehouse and office, you should take advantage of this proposition while there is stock for sale. The stock is nearly half taken without canvassing, and this notice should sell the balance of the \$10,000 stock we are commencing with. E. D. Townsend, Northstar, Michigan, is chairman of the Board of Directors of the MICHIGAN HONEY PRODUCERS' EXCHANGE, INC. He is selling stock. All producers of honey in this territory should write him for full particulars.

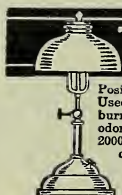
HELP WANTED

WANTED—For the season of 1922 an experienced queen-breeder; state experience, reference, age, married, or single and wages wanted. Box 4, Loveland, Colo.

SITUATIONS WANTED

EXPERIENCED queen-breeder wants permanent position. Have been a commercial queen-breeder for nine years. Have reared over 100,000 queens, reared over 16,500 this season with two helpers. Age, 29; married, and wish permanent place. Give particulars in first letter. S. E. Merrill, Mayhew, Miss.

PATENTS Practice in Patent Office and Court. Patent Counsel of The A. I. Root Co.
Chas. J. Williamson, McLachlan Building,
WASHINGTON, D. C.



The "BEST" LIGHT

Positively the cheapest and strongest light on earth. Used in every country on the globe. Makes and burns its own gas. Casts no shadow. Clean and odorless. Absolutely safe. Over 200 styles. 100 to 2000 Candle Power. Fully Guaranteed. Write for catalog. AGENTS WANTED EVERYWHERE.

THE BEST LIGHT CO.

306 E. 5th St., Canton, O.

Honey Markets.—Continued from page 673.

prised most of us, as not only has the carload demand been better than we expected, but large quantities of honey have been sold by beekeepers and others directly to consumers, and for this reason the quantity of extracted honey available for carload shipment is considerably smaller than was at first expected. It looks now as if there was a chance of getting all the good extracted honey cleaned up before the new crop comes on.

The Colorado Honey Producers' Ass'n.
Denver, Colo., Oct. 12. F. Rauchfuss, Secy'.

Special Foreign Quotations.

LIVERPOOL.—Stocks here are much reduced. Only about 200 barrels remain in first hands. We do not hear of much Chilean coming to this market. There is no Pile 2 and 3 offering. The total sales of Chilean honey during the past month amount to about 850 barrels. The value of extracted honey in American currency is about 7½ cents per pound. There is very little doing in beeswax. The value in American currency is about 22 cents per pound.

Liverpool, Eng., Oct. 3. Taylor & Co.

Too Late for Classification.

FOR SALE—Six cases amber honey, two 60-lb. cans per case, \$12.00 per case. Henry Schnauffer, 2793 N. 16th St., Cleveland, Ohio.

FOR SALE—Extra fancy clover honey well ripened and put up in new cans, 60 lbs. net; per case of two cans, \$16.00. Edw. A. Winkler, R. D. No. 1, Joliet, Ills.

HUBAM, or white annual sweet clover. Grow it for your bees, and get a seed crop, while the seed is scarce. Booking orders for fall delivery. E. G. Lewis Co., Media, Ills.

GUMMED labels of all sorts—as low as 60c per 1000—from your own copy. We also print for beekeepers at about half prices usually charged. Will open account and let payment be made on receipt of goods. Roessler, Roseville, Newark, N. J.

BOOKS recommended by A. I. Root: Tile Drainage, 25c; A B C of Potato Culture, cloth, 75c; paper, 50c; Merrybanks and His Neighbors, 15c; Winter Care of Horses and Cattle, 25c; Tomato Culture, 25c. The A. I. Root Co., Medina, Ohio.

SALESMEN WANTED—To sell "Desert Gold" honey, America's favorite. Good positions, Begin now and work where you are or write for territory. Ladies invited to apply also. Fine winter work with good wages for right parties. Give references first letter. Custer Battlefield Apiaries, Hardin, Mont.

A. I. ROOT AND WIFE GONE TO BRADENTOWN, FLA.

Mr. and Mrs. A. I. Root started for Florida on Oct. 18. They made the journey accompanied by J. T. Calvert. They report on arrival that everything seems to be in nice shape. Usually A. I. Root does not leave for the South until after election; but as there is no great issue up he decided to leave before the weather becomes inclement in the North. A year ago he did not leave until a month later, and, as our readers will remember, it was cold nearly all the way driving down by auto.

Just now Mr. and Mrs. A. I. Root are rejoicing in the arrival of a new grandson, David Huber, born to Mr. and Mrs. Huber Hall Root on Oct. 20.

Correction of Hubam Clover Advertisement.

In our October number, page 666, we printed an advertisement of the DeGraff Food Company, DeGraff, Ohio, in which it was said new Texas Hubam seed could be tested yet this year, and giving the price as \$5.00 a pound and directing that orders be sent to the Henry Field Seed Co., or direct from grower who guarantees.

This advertisement was inserted wholly by error, being a repeat of an old advertisement printed last June. See the DeGraff Food Company's advertisement in this issue for their terms and conditions of offering Hubam clover seed.

GLEANINGS IN BEE CULTURE.

Guaranteed Hubam Clover

Beekeepers consider Hubam clover the greatest honey plant ever discovered. If planted by March 15 it will bloom by June 15 and continue blooming freely until a killing frost. Hubam will make a good honey crop regardless of the season. Honey produced from Hubam is water white. The wise beekeeper will get busy and plant a generous amount of this great plant next year. If you haven't the land plant all waste lands in your locality. The price is now \$2 a pound. Be sure and get your seed while you can. Last year many were disappointed. Sweet clover honey for sale, wholesale or retail.

F. M. SCHADER, SUNNYSIDE, WASH.

NORTHERN-GROWN HUBAM SEED

BEEKEEPERS:—Now is the time for all beekeepers to secure the new Hubam annual sweet clover seed for planting on waste land next spring, and to interest and educate their neighbors in planting it. It will pay any beekeeper to give away seed and to instruct neighbors how to grow it, in order to secure bee pasturage from one of the greatest honey-yielders known. **DEALERS:**—This is just the time to get prices and to interest prospects for spring. Get the county agents back of this valuable new clover, and arrange with us to get your seed at once.

Hubam seed will be sold by all branch offices of the A. I. Root Company, and by many of our authorized distributors.

THE A. I. ROOT COMPANY
MEDINA, OHIO

1922

Place your order now for 1922 delivery of
FOREHAND'S THREE BANDS
The Thrifty Kind.

They are surpassed by none but superior to many.
Package Bees Three-Banded Queens

Write for prices now.

W. J. Forehand & Sons
Fort Deposit, Ala.

Our Guarantee and Advertising Conditions.

Believing that all the advertisers in this journal are trustworthy, we make the following guarantee of our advertising, together with a statement of the conditions we must exact both from our advertisers and from our subscribers who may patronize such advertisers:

OUR GUARANTEE (subject to conditions here-in mentioned): We will make good to paid subscribers the loss of money that may be sent to any deliberate swindler or irresponsible advertiser by reason of any misleading advertisement that may be printed in our columns.

We will promptly discontinue the advertisement of any advertiser against whom a clearly valid complaint is made by a subscriber, and such advertiser will not be restored (if at all) to our columns until he has fully satisfied such complaint; furthermore, if we find that the facts sworn to in affidavit by the complainant and the circumstances warrant it, we will then not only exclude the advertiser from our columns, but at our own expense will proceed (by law, if necessary) to compel him to make restitution or to secure his proper punishment.

WHAT WE DO NOT GUARANTEE: We will not guarantee against bankrupts sanctioned by the courts. We will not guarantee the settlement of disputes between subscribers and honest advertisers, nor against loss and delay caused by honest advertisers who may be unable to fulfill conditions or contracts because of innocent misfortune or unfavorable conditions beyond their control. We will not guarantee any deal for bees and queens in which the purchaser advances the cash to the queen or bee rearer without an arrangement, either thru a bank or express company, whereby the purchaser can examine the bees or queens upon arrival and before the cash is released to the shipper—wishing our subscribers to take the same business care we ourselves would take in making a deal for queens or bees and trusting our "cash in advance" to those only who we know by experience have an established record of honest business dealing. (In making this last condition, we in no way challenge the right and propriety of the honest, business-like, prompt queen or bee rearer to ask pay in advance, either the whole or part, for he is worthy of such confidence, has proved himself, and can secure orders on cash-in-advance terms. But the purchaser should know his bee or queen dealer, if he is to advance the cash, and if he does so it must be at his own risk—not ours). We will not guarantee the purity of any seed advertised nor any nursery stock, as nurserymen ordinarily will not do this themselves; but any seedsman or nurseryman advertising in our columns will have given us excellent references in advance, and our readers may consider this fact in their favor. We will not guarantee advertisers more than one month after the last appearance of their advertisements in our columns. We will not guarantee temporary advertisers for "help wanted," "position wanted," nor advertisers of single sales or of small or second-hand articles, in which transactions the terms of bargain and payment are special and the purchaser can, by taking care, guard his own interests.

CONDITIONS INCUMBENT UPON OUR SUBSCRIBERS: In order that our subscribers may se-

cure the benefit of our advertising guarantee, in case of need to do so, they must mention in writing to advertisers that they are replying to an advertisement seen in *Gleanings in Bee Culture*. They must give notice of complaint against an advertiser within one month of the time of the transaction complained of, and only after having made written complaint to the advertiser in question; such complaint to us must be in the form of a sworn affidavit as to the facts set forth in the complaint, if the complainant wishes us to take up his claim against the advertiser; the right of examination of the article to be purchased before payment for it, must be demanded and made in all cases wherein the purchaser does not know to his full satisfaction the dealer of whom he is to purchase. Our subscribers will be solely responsible for the terms they agree to with advertisers and must use all reasonable caution and diligence in making such terms and in satisfying themselves of the conditions and quality of any article or commodity offered for sale.

CONDITIONS INCUMBENT UPON OUR ADVERTISERS: We reserve the right, at any time, to cancel any advertising contract and discontinue advertisement, and refund, pro rata, for space not furnished under contract. Every advertiser, unless well known to us and with an established record for honest and prompt dealing, will be required to furnish satisfactory credentials as to both character and financial standing, the endorsements of a local banker, postmaster, and official, or three other endorsements equally as good, being asked for by us. Queen and bee rearers, who seek to advertise in our columns, must furnish not only satisfactory character and financial references, but must sign our Code for the Sale of Queens and Bees, answer our questionnaire as to their beekeeping and apiary conditions; and, if new in the business of selling queens and bees, must furnish us with the endorsement of at least five reputable beekeepers or a beekeepers' society, or give an indemnity bond, or furnish us with both the endorsement of beekeepers and the bond. All advertisers must not only deal honestly, but they must follow correct business practice, be prompt in business correspondence and in the delivery of goods, or else expect to be barred from our advertising columns for such business delinquencies.

WHAT WE SEEK TO ACCOMPLISH: By this guarantee and its conditions we seek the accomplishment of two purposes: to drive the unreliable advertiser out of our columns and even punish him by law if he so deserves and it is possible to do it; to be relieved of the burden thrown upon us in the past by the unwise deals of our readers and unjust complaints against honest advertisers.

INDIANOLA APIARY

is now booking orders for 1922 for Italian bees and queens. Write for price list and circular. No disease. Bees inspected by State inspector.

J. W. SHERMAN

Valdosta, Ga.



Shrubs and Trees

That provide Nectar for the Bees and Fruit for the household. No Cash with order. Get our Catalog TODAY.

PROGRESS NURSERIES
1317 Peters Ave. Troy, Ohio

MASON BEE SUPPLY COMPANY

MECHANIC FALLS, MAINE

From 1897 to 1921 the Northeastern Branch of The A. I. Root Company.

PROMPT AND EFFICIENT SERVICE
BECAUSE—Only Root's Goods are sold.

It is a business with us—not a side line.
Eight mails daily—Two lines of railway.
If you have not received 1921 catalog send name at once.



"Best" Hand Lantern

A powerful portable lamp, giving a 300 candle power pure white light. Just what the farmer, dairyman, stockman, etc. needs. Safe—Reliable—Economical—Absolutely Rain, Storm and Bug proof. Burns either gasoline or kerosene. Light in weight. Agents wanted. Big Profits. Write for Catalog. **THE BEST LIGHT CO.**
306 E. 5th St., Canton, O.

Established 1885.
Write us for catalog.

BEEKEEPERS' SUPPLIES



The Kind You Want and the Kind That Bees Need

We have a good assortment in stock of bee supplies that are mostly needed in every apiary. The A. I. Root Co.'s brand. Let us hear from you; information given to all inquiries. Beeswax wanted for supplies or cash.

John Nebel & Son Supply Co.

High Hill, Montgomery Co., Mo.

Bees & Queens for 1922

10 Per Cent Discount for Orders Received Before 1922

One 1-frame nucleus with untested queen, \$4.00; one 2-frame nucleus with untested queen, \$5.00; untested queens, \$1.25 each; 12, \$1.10 each; tested queens, \$1.60 each; 12 or more, \$1.35 each; select tested queens, \$2.00 each. Breeders, \$5.00 at all times.

H. L. MURRY, SOSO, MISS.

LEWIS 4-WAY BEE ESCAPES

Four exits from supers. Fits all standard boards. Springs of coppered steel. Made of substantial metal. Price each 20c postpaid. Made by **G. B. Lewis Company, Watertown, Wis., U.S.A.**

Sold only by Lewis "Beeware" Distributors.

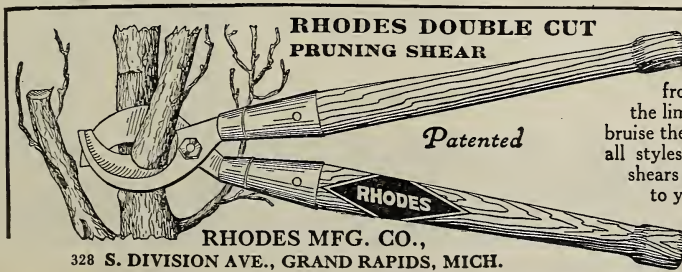


RAW FURS

Graders' Guide and Price List Free

READY NOVEMBER 20

GEO. E. KRAMER, Valencia, Pa.



RHODES DOUBLE CUT PRUNING SHEAR

Patented

RHODES MFG. CO.,
328 S. DIVISION AVE., GRAND RAPIDS, MICH.

THE only pruner made that cuts from both sides of the limb and does not bruise the bark. Made in all styles and sizes. All shears delivered free to your door.
Write for circular and prices.

New Prices on Friction-Top Pails

| | 25 | 50 | 100 | 200 | 500 | 1,000 |
|--|---------|----------------|---------|---------|---------|---------|
| 2½-lb. cans | \$1.50 | \$2.25 | \$ 4.10 | \$ 8.00 | \$19.50 | \$38.00 |
| 5-lb. pails | 2.15 | 3.90 | 7.45 | 14.60 | 34.50 | 67.50 |
| 10-lb. pails | 2.75 | 5.25 | 10.00 | 19.75 | 47.50 | 94.00 |
| 5-lb. Pails in reshipping cases of 12..... | \$1.30; | ten cases..... | \$12.00 | | | |
| 10-lb. Pails in reshipping cases of 6..... | 1.00; | ten cases..... | 9.00 | | | |
| 1-lb. Round jars, 24 to case, per case... | 1.70; | ten cases..... | 16.50 | | | |
| ½-lb. Round jars, 24 to case, per case... | 1.50; | ten cases..... | 14.00 | | | |
| 6½-oz. Tumblers, 48 to case, per case..... | 1.65; | ten cases..... | 16.00 | | | |

Comb Honey Shipping Cases

There is an increasing interest in the production of Comb Honey, and a material reduction in price on the shipping cases. You will get better prices for your honey if put up in these attractive packages. We quote below:

| | 10 | 50 | 100 |
|---|--------|---------|---------|
| 24-lb. four-row for 1⅞-in. sections | \$6.00 | \$29.00 | \$57.50 |
| 24-lb. four-row for 1½-in. sections..... | 5.85 | 28.35 | 56.00 |
| 24-lb. four-row for 4 x 5 sections..... | 5.85 | 28.35 | 56.00 |

Paste for Tin and Glass Packages

We have a very excellent paste for fastening labels on your glass-ware or pails. **THEY STICK.** We are quoting prices below. Postage extra.

| | |
|----------------------------------|--------|
| "A" grade paste, per pint..... | \$.30 |
| "A" grade paste, per quart..... | .55 |
| "A" grade paste, per gallon..... | 2.00 |

5% Cash Discount for November Orders

This discount applies to goods wanted for use next season, and does not apply to orders for honey containers listed above.

**BUY
NOW**

the goods you need for next spring, taking advantage of the discount, and getting them ready for use during the winter months. Quantity discount allowed on the larger orders in addition to the early order discount. Quotations gladly furnished on the list of goods you need, showing exact cost.

WE SELL "ROOT QUALITY" BEE SUPPLIES ONLY.

M. H. HUNT & SON

510 North Cedar Street, Lansing, Michigan

NEWMAN'S BRED FROM THE BEST ABSOLUTELY ITALIAN FIRST QUALITY QUEENS and fully guaranteed. No disease. Satisfaction and safe arrival.

Untested, \$1.25; 6, \$7.00;
12, \$13.50. Select Un-
tested, \$1.75; 6, \$9.00;
12, \$17.00. Circular free.

A. H. NEWMAN, Queen Breeder
MORGAN, KY.

Buy Your Bee Supplies Now

Take advantage of early-order discounts by ordering NOW. We guarantee to please you. "Prompt service and the very best" is our motto. *We want your beeswax and old comb.* Highest cash and trade prices offered. Texas beekeepers should write A. M. HUNT, Goldthwaite, Texas.

Manufactured by

Leahy Manufacturing Company

95 Sixth St., Higginsville, Missouri

Write for FREE catalog. It is to your interest.

Southern Headquarters

Reliable Three-Banded Italian Queens

By Return Mail

Large, vigorous, well marked.
Guaranteed to please you. We
can make deliveries to Oct. 20.

Untested

| | |
|---------------|--------|
| Each | \$1.00 |
| Six | 5.50 |
| Twelve | 10.50 |
| Twenty-five.. | 20.00 |
| Fifty | 38.00 |

Tested

| | |
|------------|--------|
| Each | \$1.75 |
|------------|--------|

Safe arrival and satisfaction
guaranteed.

W. D. ACHORD
FITZPATRICK, ALA.

Bees & Queens for 1922

Is there a great difference among bees and queens? Mr. Beekeeper, with bees and queens a small difference counts high. A small per cent better laying queen will greatly increase the field force; this will insure a larger honey yield per colony. A small per cent better worker will aid wonderfully. A small per cent more gentleness will greatly reduce the stings; this increases the efficiency and speed of handling, not counting the pleasure. A small per cent of better marking adds wonderfully to the beauty of the colony. By developing the small qualities of my bees and queens I have attained marked success in producing better queens and bees. My aim is to produce bees and queens that will meet the high standard required by beekeepers. Let me book your order for 1922. One-fourth the full amount will insure your getting bees and queens when you want them most next spring. Perfect satisfaction, safe delivery, and pure mating guaranteed. Pure Italian bees and Three-Band Italian queens of the better kind.

Untested—1, \$1.50; 6, \$7.50; 12, \$13.50. Selected Untested—1, \$1.75; 6, \$9.00; 12, \$16.50. Tested—1, \$2.50; 6, \$13.00; 12, \$24.50. Selected Tested—1, \$4.00; 6, \$22.00; 12, \$41.50. One pound bees, \$2.75; two pounds bees, \$4.75; three pounds bees, \$6.75. If queen is wanted with bees add price. Write for prices on large lots.

N. FOREHAND, RAMER, ALABAMA

**BANKING
BY MAIL
AT 4%**

Don't Tie Up Your Money

but put it where it will grow under your own control
and faster than in any other safe way.

Write for our "Banking by Mail" booklet.

THE SAVINGS DEPOSIT BANK CO.
A.T. SPITZER, Pres.
E.R. ROOT, Vice Pres. E.B. SPITZER, Cash.
MEDINA, OHIO

Slum Gum Old Combs

worked into beeswax at 5c per pound, minimum charge \$1.00. Pay taken from wax.

Market price paid for the wax, worked into foundation, or traded for supplies.

Working Beeswax into foundation is a specialty with us.

Ship to Falconer, New York. Mark each package with your name and address both inside and outside.

Write for Red Catalog of Beekeepers' Supplies and REDUCED price list.



W. T. Falconer Mfg. Co.
Falconer, N. Y., U. S. A.

"Where the best beehives come from."

CANDY FOR WINTER FEED

In winter bees sometimes starve with plenty of honey in the hive. Use candy and avoid this unnecessary loss. Put up in large paper plates weighing two pounds each. Write for price, also catalog of Bee Supplies.

H. H. JEPSON

182 Friend St.

Boston, 14, Mass.

ROOT'S BEE SUPPLIES

Carload stocks at Ohio's distributing center. Orders filled the day they come in. Save time and freight by ordering from

A. M. MOORE, Zanesville, Ohio
22½ S. Third Street.



World's Best Roofing at Factory Prices

"Reo" Cluster Metal Shingles, V-Crimp, Corrugated, Standing Seam, Painted or Galvanized Roofings, Siding, Wallboard, Paints, etc., direct to you at Rock-Bottom Factory Prices. Positively greatest offer ever made.

Edwards "Reo" Metal Shingles

cost less; outlast three ordinary roofs. No painting or repairs. Guaranteed rot-fire, rust, lightning proof.



LOW PRICED GARAGES
Lowest prices on Ready-Made Fire-Proof Steel Garages. Set up any place. Send postal for Garage Book showing styles.
THE EDWARDS MFG. CO.,
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Get our wonderfully low prices and free samples. We sell direct to you and save you all in-between dealer's profits. Ask for Book No. 188

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Samples &
Roofing Book

FOR YOUR 1921 CROP

Comb honey shipping cases, honey cans, friction-top pails. Price on application.

Early order cash discount on sections, hives, supers, frames, comb foundation, and other goods.

Buy now and get supplies ready for 1922. Make out your list, and send for our prices.

AUGUST LOTZ COMPANY, BOYD, WIS.

Every Step in Beekeeping

By Benjamin Wallace Douglass

A brand-new book based on the most up-to-date scientific information and thorough practical experience that tells how to keep bees for profit.

A book of directions, every step made clear, so that the beginner may start right and go forward without floundering. Delightfully written. Author was formerly State Entomologist of Indiana and has been a successful beekeeper for years.

Illustrated with thirty-one photographs. Price \$2.50. Sent postpaid on approval to any subscriber if the name of this paper is mentioned.

THE BOBBS-MERRILL CO.
Vermont Plaza, Indianapolis, Ind.

A Cinch for Beekeepers

That's what HUBAM means

It makes a wonderful honey flow from early summer to killing frost; is a splendid legume for pasture or hay; and a luxuriant growth to plow under for humus and plant food. Besides this, the cash crop from the seed alone is no small item. Our average yield has been 400 lbs. per acre. Let us send you our Seed Sense magazine free. Tells all about it. We offer genuine, certified HUBAM at \$2.00 per pound on early orders.

Henry Field Seed Co.
SHENANDOAH, IOWA.

5 REASONS WHY ---

**You will want
to send us the
coupon at once**

*Money Saved Is
Money Made*

The A. I. Root Co. of Iowa,
Council Bluffs, Iowa.

Gentlemen:—Kindly name your fall prices of the following:

1. Eight-frame hives, metal covers, complete, sets 5 KD.
2. Eight-frame bodies, with frames, complete, sets 5 KD.
3. Shipping cases, lots of.....
4. Cans, jars, pails, and second-hand 5-gal. cans.
5. Honey tanks.

Name

Address

City

State

THE A. I. ROOT CO. OF IOWA
COUNCIL BLUFFS, IOWA

Guaranteed Seed of the Greatest Honey Bearing Clover

Enthusiasm for Hubam (the annual white sweet clover) as a honey-bearing plant is constantly growing among beekeepers. It blooms in three to four months and continues blooming for a longer period than other honey-bearing plants.

Hubam has a legume action that makes it one of the greatest soil-builders. It bears hay and seed in great quantities. And it saves a full year in the usual crop rotation.

These advantages have made it popular in a wonderfully short time.

We are large-scale growers of Hubam seed with acreage in Texas, Ohio, and North Dakota. Because accidental mixing of this seed is easy we grow nothing but Hubam, and absolutely guarantee the purity of the seed shipped under our seal.

DE GRAFF FOOD COMPANY, SEED DEPT. 303, DE GRAFF, OHIO

The Rosedale Apiaries Big Bend, La.

J. B. MARSHALL and
H. P. LE BLANC, Props.

Can supply you promptly April 15th to May 30th, 1922, with the very best Italian Bees and Queens at following prices:

1-fr. nucleus, 1 lb. bees.....\$3.00
2-fr. nucleus, 2 lbs. bees..... 6.00

Add price of queen.

Untested Queens, each..... 1.50
Tested Queens, each..... 1.75

No bee disease in territory. Health certificate goes with each shipment.

Special prices to large orders.

Package Bees and Reliable Queens

GOLDEN AND THREE-
BANDED ITALIANS

We are now in a position to accept orders for queens and bees for 1922 shipping, in large quantities.

We have the stock and the equipment and experience necessary to handle your orders, whether large or small, and promptly and in a satisfactory manner. All packages are headed with large vigorous young queens of our own production. You will be pleased with the stock and service we can give you. Write for our price list.

E. A. SIMMONS
GREENVILLE, ALA.

Our Food Page—Continued from page 698.

STANDARD CAKE RECIPE.

$\frac{1}{4}$ cup butter or margarine $1\frac{1}{2}$ to $1\frac{3}{4}$ cups sifted pastry flour
 1 cup sugar 3 level teaspoons baking-powder
 2 eggs in measuring cup $\frac{1}{8}$ teaspoon salt
 Milk to fill cup $\frac{3}{4}$ teaspoon flavoring extract

HALF SIZE FOR SMALL FAMILY.

2 level tablespoons margarine $\frac{3}{4}$ to $\frac{7}{8}$ cup sifted pastry flour
 $\frac{1}{2}$ cup sugar $1\frac{1}{2}$ teaspoons baking-powder
 1 egg in measuring cup
 Milk to fill cup half full A few grains salt
 $\frac{3}{8}$ teaspoon flavoring extract

Measure the margarine or butter by filling a measuring cup $\frac{3}{4}$ full of cold water and adding enough margarine to make it even full. Pour out the water and put the margarine into a mixing bowl, which has been warmed by rinsing in boiling water. While the margarine is softening slightly, measure the flour, after once sifting, and after reserving a little put the rest into the sifter with the baking-powder and salt. The flour should be measured by dropping it lightly into the cup without shaking it down. This recipe takes $1\frac{1}{4}$ cups of the brand of pastry flour I am using at present, but flours vary so much in absorbing power that it is impossible to give the exact measurement. Even the same brand varies at different times. The batter should be thick enough to drop from the mixing spoon rather than pour in a thin stream. Break the eggs in a cup, beat lightly with a fork and then fill the cup with sweet milk. Cream the margarine in the bowl, add the sugar gradually, working it until smooth and add the flavoring extract. Then add about a third of the combined milk and egg and sift in a third of the flour, beating until smooth, and continue adding them alternately until all the flour and liquid are in, using the reserved flour, if necessary. Beat the batter vigorously about a minute, divide into two layers or put it all in a loaf pan and bake in a moderate oven, 15 to 20 minutes for the layers and about 40 minutes for the loaf. The pans should be well greased and flour lightly sifted over the surface.

Any preferred filling or frosting may be used with this cake or 1 cup of chopped nuts may be added to the batter. It will make twelve good-sized individual cakes.

LARGE, HARDY, PROLIFIC QUEENS

Three-band Italians and Goldens. Pure mating and safe arrival guaranteed. We ship only queens that are top notchers in size, prolificness, and color. After June 1st; Untested queens, \$1.50 each; 6 for \$8.00; 12 or more, \$1.40 each; 25 or more, \$1.25 each. Tested queens, \$3.00 each; six for \$16.00.

Buckeye Bee Co., Justus, Ohio.

BARNES'

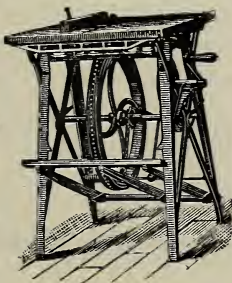
Hand and Foot Power Machinery

This cut represents our combined circular saw, which is made for beekeepers' use in the construction of their hives, sections, etc.

Machines on Trial

Send for illustrated catalog and prices.

W. F. & JOHN BARNES CO
645 Ruby Street
ROCKFORD, ILLINOIS



Completely Destroys the Weed Growth

More than that, the BARKER breaks the hardest crust into a level, porous, moisture-retaining mulch—all in the same operation.

A ten-year-old boy can run it—do more and better work than ten men with hoes. Saves time and labor, the two big expense items.

BARKER WEEDER, MULCHER AND CULTIVATOR

Eight reel blades revolve against a stationary underground knife—like a lawn mower. **BEST WEED KILLER EVER USED.** Works right up to plants. Cuts runners. Aerates the soil. Has leaf guards, and shovels, for deeper cultivation—3 garden tools in 1.

FREE ILLUSTRATED BOOK.

Tells how gardeners and fruit-growers everywhere are reducing their work; increasing their yields.—How to bring growing plants through a dry season.—How to conserve the moisture and force a larger, more rapid growth. Send TODAY for this free, illustrated book and special Factory-to-User offer.

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David City, Neb.

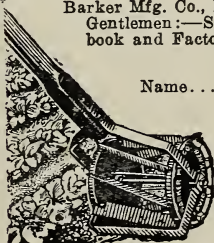
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Gentlemen:—Send me postpaid your free book and Factory-to-User offer.

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QUEENS FULL COLONIES AND NUCLEI QUEENS

Our bees are hustlers for honey, prolific, gentle, very resistant to European Foul Brood, our customers tell us. For years we have been shipping thousands of queens and pounds of bees all over the U. S. A. and Canada. We are continually getting letters with statements such as the following: "Well pleased with your stock," "Best we ever had," "The bees we got from you are the tops (best) we have in our 225 colonies," "Bees arrived in fine shape, well pleased," etc., etc. Write for circulars giving details, etc. We are quoting a lower price for balance of the year, but will still hold up the high standard of quality.

I have a good proposition for 2 or 3 Northern beekeepers that would like to come South this fall. Write for particulars.

QUEENS AFTER JULY 1st, BALANCE OF THE YEAR:

| | |
|---|--|
| Untested \$1.35 each; 25 or more, \$1.00 each | 1 lb. of bees.. \$2.25 each; 25 or more, \$2.13 each |
| Select Unt. . . 1.50 each; 25 or more, 1.25 each | 2 lbs. of bees.. 3.75 each; 25 or more, 3.56 each |
| Tested 2.25 each; 25 or more, 1.75 each | 3 lbs. of bees.. 5.25 each; 25 or more, 4.98 each |
| Select Tested.. 2.75 each; 25 or more, 2.00 each | Add price of queen wanted when ordering bees. |

Safe arrival guaranteed within six days of here.

MY FREE CIRCULARS FOR-1922 SHIPPING, quoting lower prices for package bees and queens, are ready to mail. Send for one before placing your order.

One of my customers from Canada wrote he was getting an average of over 200 lbs. this year from bees bought of me last year. Another wrote he was getting 90 pounds this year from packages bought this spring.

NUECES COUNTY APIARIES

E. B. AULT, Prop.

CALLEN, TEXAS

Italian Bees and Queens

Book your order now for 1922 delivery. If prices decline we will protect you, if they advance you get your bees at these prices.

2,000 Colonies

FREE OF DISEASE and headed with young queens to draw from. REMEMBER YOU ABSOLUTELY CAN'T GET DISEASE FROM US.

POUND PACKAGES---NOTE, WITH QUEEN

| |
|--|
| 1-lb. package, with queen, \$4.00; 10 or more \$3.50 |
| 2-lb. package, with queen, 5.50; 10 or more, 5.00 |
| 3-lb. package, with queen, 7.25; 10 or more, 6.75 |

NUCLEI---NOTE, WITH QUEEN

| |
|---|
| 1-fr. nucleus, with queen, \$4.00; 10 or more, \$3.50 |
| 2-fr. nucleus, with queen, 5.50; 10 or more, 5.00 |
| 3-fr. nucleus, with queen, 7.25; 10 or more, 6.75 |

We are in position to fill orders for, from 100 to 4,000 nuclei or packages. Write us. Safe arrival and satisfaction guaranteed. Reference, any Bee Journal.

TERMS: 25% TO BOOK ORDER.

THE STOVER APIARIES, MAYHEW, MISS.

THREE-BANDED

LEATHER-COLORED

20,000 Italian Queens for 1922 4,000 Packages and Nuclei SOUTHLAND QUEENS THEY EXCEL

Bred from Root Home-Bred Selected Breeders. Backed by over 50 years' experience in breeding the Best, Most PROLIFIC queens of today.

EXTREMELY PROLIFIC BRED FOR SERVICE A FEW VOLUNTARY LETTERS.

New Liskeard, Ont., Canada.

Your queens are the largest, finest, most prolific I have ever handled. Have purchased queens from the largest breeders in the country and yours surpass them all. They are hardy, resistant. They eat up E. F. B. Am telling all my neighbors about your queens.

Slater, Wyoming, Sept. 22, 1921.

Queens arrived O. K. Received Sept. 9th. A day and a half from the time the queen was turned loose there were FOUR frames filled with eggs. Thanking you for your good queen, I remain,

Vancouver, B. C., Sept. 1, 1921.

We received the queens several days ago. I might say that while I have imported several hundred queens this year these are the best in the Leather-colored Italians that have been imported yet. The leather-colored bees are winning favor over the goldens in this province.

20,000—QUEENS—20,000

Untested, \$1.50; 12 or more, \$1.25; 25 or more, \$1.15; 50 or more, \$1; 100 or more, 90c.
Tested, \$2.50; 12 or more, \$2.25; 25 or more, \$2.15; 50 or more \$2; 100 or more, \$1.90.

POUND PACKAGES—SHIPPED ON COMB OF FOUNDATION

(F. O. B. Shipping Point by Express.)

1-lb. package, no queen, \$3.00; 25 or more, \$2.25; 50 or more, \$2.15
2-lb. package, no queen, \$5.00; 25 or more, \$3.75; 50 or more, \$3.50
3-lb. package, no queen, \$7.00; 25 or more, \$5.25; 50 or more, \$5.00

NUCLEI

Good strong combs—filled with brood. Same prices respectively as pound packages.

**WE GUARANTEE SAFE ARRIVAL. MISMATED QUEENS REPLACED.
BOOK YOUR ORDER NOW. OUR SUPPLY IS LIMITED.**

THE SOUTHLAND APIARIES
BOX 585, HATTIESBURG, MISS.

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CURRENT EVENTS and EDITORIALS

STORIES and HOME HELPS for Mother

Bright Girls find 100 Features

Live Boys always like the things to DO and to MAKE of ADVENTURE and SPORT

for ALL

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The Youth's Companion

A LIVE, TIMELY, moving feast of good things *and you will get them nowhere else.* The YC is unique in its reader-serving, home-serving, community-serving power. It is vastly more than reading. It is a friend and inspirer and an entertainer also. It tells how to do things—how to earn—how to save. It helps every interest of everyone in the family.

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STAMPS TO STICK, GAMES, SPORTS, PUZZLES, "HOW-TO-MAKE" PAGES, SUGGESTIONS FOR HOME EFFICIENCY AND ECONOMY.

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The Companion is one of the strongest forces for making America a land to love and to serve with loyalty. Every page reflects ideals—ideals for the boy and the girl, ideals for the parents in their relations with each other and their children and the world. It is a constant stimulant to high thinking, to clean living, to patriotism.

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EVERY NEW SUBSCRIBER who cuts out and sends this slip with the subscription price will at once begin to receive the extra issues indicated:

1. THE YOUTH'S COMPANION for 1922
52 Splendid Weekly Issues
2. All the remaining 1921 Weekly Issues
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ALL FOR
\$2.50
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THE YOUTH'S COMPANION, BOSTON, MASSACHUSETTS

Gleanings in Bee Culture



I heard the bells on Christmas day
Their old familiar carols play,
And wild and sweet
The words repeat
Of peace on earth, good will to men.

— *Longfellow.*

VOL. XLIX

December 1921

NUMBER 12

LOWER PRICES

Pending the publication of our new catalog, send us your lists of requirements of bee supplies and we will quote you our new prices. New catalog out January, 1922, mailed on application.

**THE MILLER BOX
MANUFACTURING CO.**
LOS ANGELES, CALIF.

"Griggs saves you freight."

TOLEDO

By the time you read this our 1921 crop will be history. How about your Honey Cans, Comb-honey Cases, Extractors? Let us know your wants. We can serve you promptly and well.

Honey, New Crop

Send sample and say how much you have, kind, how packed, and price asked in first letter.

Beeswax always wanted.

THE GRIGGS BROS. CO.

Dept. 25

Toledo, O.

"Griggs saves you freight."

Bee Hives & Frames

Below Cost

Lumber prices are lower. We are pricing our goods on the basis of present lumber costs with a narrow margin of profit, which means that goods on hand made from lumber bought at high prices are being sold below cost. Send for new condensed price list. Give us a list of goods needed and get our prices. We want to serve you.

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OF CALIFORNIA

1824 E. 15th St., Los Angeles
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